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COMPUTERWORLD

Vendors to lighten up license woes

By William Brandel

In an effort to make it easier for users to buy and distribute their software within corporate enterprises, Novell, Inc. and Microsoft Corp. are preparing to roll out enterprise-level licensing programs for their high-end customers.

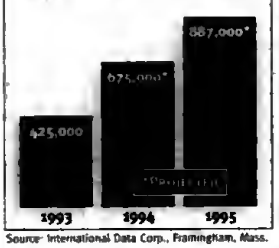
Novell is gearing up for a Nov. 1 announcement of its first comprehensive licensing program, which will cover both Novell and WordPerfect products. The program will integrate Novell's Master License Agreement with WordPerfect's Corporate Advantage Program, a Novell source said.

Corporate users who subscribe to the revised program will be able to distribute via CD-ROM any application or system software program made by either WordPerfect or Novell. The two-CD set will be

License woes, *page 12*

Serving platters

Worldwide shipments of CD-ROM units in PC servers



Source: International Data Corp., Framingham, Mass.

Sybase raises DB ante

By Kim S. Nash

Sybase, Inc. plans to boost performance and support several different multiprocessing schemes with a next-generation database now in development, according to internal Sybase documents.

The database, code-named System 11, is expected to improve performance by at least 20% to 30% over System 10 and also to support clustered and symmetrical multiprocessing systems of eight or more CPUs. The new architecture will give database administrators more control in setting processing parameters and tuning the database for specific kinds of applications.

Overall, a primary goal of System 11 is to provide more "flexible support for a broad mix of applications [via] a work load-adaptable architecture," the documents said.

In other words, users will be able to tune and configure many more database functions than are currently accessible in the more closed System 10 product, according to several Sybase users and developers, some of whom have been briefed by the company on System 11.

Rev it up

Sybase's next-generation System 11 database will focus on boosting performance by adding:

- Integrated Distributed Computing Environment services, including security, unified log-in and naming features
- Automatic stops for runaway queries
- Faster creation and population of multiple-gigabyte databases

Details to emerge

The Emeryville, Calif., vendor plans to ship the product in stages during the next 12 to 18 months but will outline System 11 details before year's end, confirmed Berl Hartman, vice president of product marketing.

Among the more notable features planned for System 11 are the following:

Sybase, *page 133*

IBM stirs PC mix again

PC Co. details revamp, unveils systems, strategy

By Michael Fitzgerald and Jaikumar Vijayan

The now-annual PC Co. reorganization will kick off today with the launch of new servers, PCs, notebooks and yet another strategy for righting IBM's still listing ship.

During the year, IBM has suffered from shrinking market share, inventory buildups in excess of $600 million and backlogs on hot products such as its ThinkPad family of notebooks. Most recently, IBM underestimated demand for Aptiva, its new home PC. Aptiva sold out almost immediately, which could cause IBM to miss out on the holiday buying season.

And while resellers say IBM's inventory situation has greatly improved since earlier this year, the company could run into desktop inventory shortages again in the fourth quarter because many of its new systems will not appear

IBM, *page 133*



IBM's Richard Thoman *will stress product streamlining in the desktop arena in his first major public appearance*

Customer service

Big Brother mans help desk

By Julia King

Ever have the feeling you're being watched? By the electric company? By your private branch exchange manufacturer? By the store that sold you that side-by-side freezer last year?

If so, you are not paranoid. Clinically speaking, anyway. You've probably joined the growing number of individual and corporate customers whose every contact with a company is being closely monitored by new, highly integrated customer interaction systems.



"Right now, the [customer interaction system] marketplace is really growing at a rapid rate," said Hugh Bishop, manager of emerging technologies at Aberdeen Group in Boston. "The number of players has blossomed from about a half dozen to over 100."

Consisting of several discrete but compatible client/server-based software modules, customer interaction systems track everything from initial sales to subsequent complaints — or kudos — and service calls. This information, collected from the help desk, can then be assembled into integrated customer profiles.

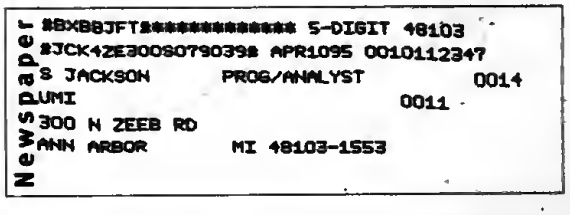
Help desk, *page 96*

Best-of-breed suites to hit high end

By Rosemary Cafasso

Several small client/server software providers are hatching plans to take on their giant rivals — most notably SAP America, Inc. — by forming alliances to deliver software sets that would compete with application suites from the big boys.





These would-be alliances are long shots at best, observers said. The big draw is that the groups could deliver more application choices than could any single vendor. And the bottom line is, most users want choices.

Yet these alliance planners have no detailed answers ready on an equally critical user issue: application integration.

Nonetheless, a number of efforts are on the drawing board, including the following:

a Platinum Software Corp. last week told a group of several hundred customers that it is working with such companies as Sybase, Inc. to offer application sets "so that our customers can fashion best-of-breed suites instead of selecting a suite with mediocre products from one vendor."

Suites, *page 133*

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What's Inside

October 17, 1994



What was it like to work on David Cutler's team? The real story behind Windows NT. See In Depth, page 105.

SHOWSTOPPER!

The Breakneck Race to Create Windows NT and the Next Generation at Microsoft

By G. Pascal Zachary

Executive Briefing

Sybase will start releasing details about its next-generation database management tool before the end of the year. System 11 will be released in stages during the next year and a half. Performance may be as much as 30% greater than that found in System 10, and users may see clustering and symmetrical multiprocessing capabilities supporting eight or more CPUs. *Page 1*

Help desks aren't just for answering hardware and software questions anymore. Thanks to new, integrated software, they're evolving into customer service and information clearinghouses. *Page 1*

Inadequate planning and management are being blamed for the U.S. Department of State's struggles with its financial systems. The agency has been working on the systems for more than a decade but is not on a course likely to solve those problems, according to a recent report by the U.S. General Accounting Office, the audit and investigative arm of Congress. *Page 20.* Like client/server before it, multimedia is presenting IS shops with the huge challenge of finding talented individuals with the requisite technical and business skills. *Page 28*

Call it data dyslexia. More and more, managers will find themselves plowing through mountains of data, knowing what the numbers say but without a clue as to their meaning. It's a problem of data context, or lack there of. Without knowing the context in which information is created or transmitted, you can get a very wrong message about what it means. *Page 89*

On site this week. A pair of IBM's new air-cooled parallel mainframes has helped The Sabre Group reduce transaction costs while avoiding both application conversion work and data center investments. The parallel systems worked without problems through a recent fare war in which Sabre's message rate was at an all-time high. *Page 75.* Six months after Pacific Gas & Electric announced a three-way partnership with Microsoft and Ontos, the California utility is about to deploy cutting-edge object-oriented applications. *Page 83.* The second time around was magic for the American Society of Landscape Architects, thanks to a bulletin-board package that provides member services. *Page 65*

NEWS

■ New signs point to an agreement between **IBM** and **Apple** on a common hardware platform that could run operating systems from both companies. *Page 4*

■ **Cisco** aims to take a bite out of the mainframe controller market with a **TCP/IP-to-host** interface for its routers. *Page 6*

■ **Microsoft** backs down a bit on **SQL Server** pricing but that may not be enough to placate all users. *Page 6*

■ Telephone and cable companies scramble for partners in the battle to control the **wireless networking** airwaves. *Page 7*

■ The **Object Management Group** will take a crucial vote on the Common Object Request Broker Architecture 2.0 object interoperability standard. *Page 8*

■ Digital is ready to revamp its **Alpha AXP server** lineup, giving workgroup users PC-like components and multiprocessing. *Page 10*

■ Novell is taking a slow but steady approach to a new **enterprise licensing** paradigm. *Page 12*

■ IBM ships **OS/2 Warp** and says it will begin beta testing LAN and server versions of the product. *Page 15*

■ **Unisys A Series** customers express keen interest in the vendor's new A11 and A14 mainframe systems. *Page 24*

■ **Computer security** products are getting tougher but so are the bad guys. *Page 14*

■ **Lotus** shuffles executive management and promotes Notes through a deal with Sun. *Page 16*

■ **Distributors** have indicated they will not be prepared to carry inventory for desktop vendors as the busy season approaches. *Page 32*

DESKTOP COMPUTING

■ Vendors are beginning to offer products that will make **upsizing** somewhat easier for users. *Page 45*

WORKGROUP COMPUTING

■ Hardware performance boosts and new systems management features hit the Unix market. *Pages 57 and 60*

ENTERPRISE NETWORKING

■ Network managers charged with linking remote LANs to central LANs can look to **Integrated Services Digital Network** services. *Page 65*

LARGE SYSTEMS

■ Closer look: Users are discovering that enterprise **storage management** in a world of distributed computing requires a learn-as-you-go approach. *Page 73*

APPLICATION DEVELOPMENT

■ Users gain some relief from the problems of **version control** and **configuration management** in client/server environments. *Page 83*

MANAGEMENT

■ Allan E. Alter says **long-term IS planning** doesn't work anymore. *Page 97*

CAREERS

■ **Relational database** professionals still view the world as flat. For them, object databases will be a revelation. *Page 111*

MARKETPLACE

■ Inventory control, freight consolidation and warehousing are among the first processes to be farmed out to **logistics** providers. *Page 121*

COMMENTARY

■ **Bill Laberis** warns of the hidden costs in distributed computing. *Page 40*

■ **Neal Goldsmith** says questions of policy, privacy and marketing linger for the information superhighway. *Page 41*

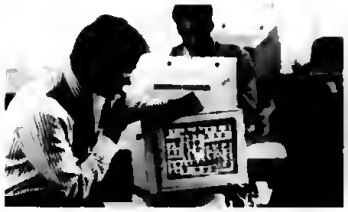
■ **Max Hopper** reminds IS staffers that they must measure their performance, or they will be measured. *Page 41*

■ **Kimball Brown** says Sony and AT&T have paved the way for new forms of information access. *Page 45*

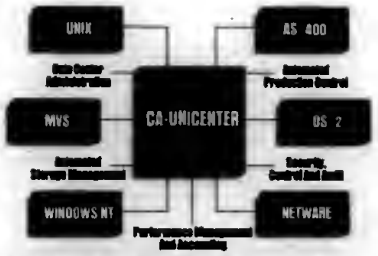
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The 5th Wave *by* Rich Tennant

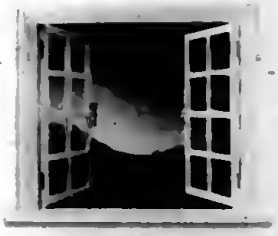




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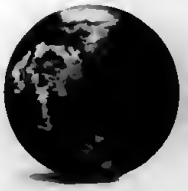
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Compaq fights to stay on top

By Michael Fitzgerald and Jaikumar Vijayan

Is Compaq Computer Corp. headed for a fall? The No. 1 PC maker is battling a lot of fires, and it may not be able to put them all out before its margins are burned.

The biggest fire is product-related: Compaq may have too many of the wrong products and not enough of the right ones, according to several analysts.

"Compaq is having its share of misses," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

For instance, analysts said Compaq carried a $2 billion-plus inventory stockpile at the end of last quarter. Wall Street analysts further noted that Compaq had cut back orders to several suppliers, including VLSI Technology, Inc., in the third quarter due to high inventory levels.

A Compaq spokesman said the inventory buildup was deliberate to avoid backlogs in the traditionally high-volume fourth quarter.

Another problem, according to Martin Reynolds, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif., is Compaq's heavy support of the 486 in the face of Intel Corp.'s Pentium push.

In fact, part of the inventory problem appears to be its 486-based ProLiant servers. According to documents obtained by *Computerworld*, Compaq is offering sales representatives significant cash incentives for at least one major reseller, Vanstar, Inc., to sell 486-based ProLiants.

Analysts worry that Compaq could get stuck with its primarily 486-based inventory if Intel further accelerates its shift to Pentium.

Products hard to find

Meanwhile, customers say high-end versions of the LTE Elite notebook and the SmartStation expansion unit continue to be hard to find, six months after they were announced, and several users said they were having quality problems with Elite.

Compaq has slipped from a virtual first-place tie with Toshiba America Information Systems, Inc. to a distant second in the notebook market, according to recent Dataquest, Inc. figures.

Besides these issues, observers point to slowed product development cycles at Compaq, which took two years to replace its Contura and high-end LTE Lite notebook lines. Compaq needed a similar amount of time to revamp its high-end DeskPro/M line.

Some suggest that Compaq has expended too much energy on the Contura Aero subnotebook, a disappointment in the market, and the Mobile Companion handheld computer, which is now shelved.

One large Elite buyer said that despite the supposed quality of the high-end box, some 7% of his Elites have come "dead on arrival" — a higher rate than with his IBM PC Co. ThinkPads — and one unit actually started smoking.

Analysts said none of these issues alone would necessarily derail the Compaq train, which has posted several consecutive quarters of exceptionally strong sales and earnings.

"Clearly they've grown at a dramatic pace, so you'll have hiccups here and there," said Todd Bakar, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Court rules against AMD

Says company violated copyright laws in using Intel emulation code

By Jaikumar Vijayan

In a potentially damaging verdict, a U.S. District Court last week ruled that chip maker Advanced Micro Devices, Inc. (AMD) violated copyright laws in using a certain piece of Intel Corp.'s 486 software code, called in-circuit emulation, on its 486 clones.

As a result, AMD said it would stop selling chips containing the offending code — used primarily for system debugging — and destroy the inventory of finished products carrying the code. In March, AMD won the right to use Intel 486 code, but the vendors have continued to dispute the definition of what the code is.

Taking what it said were purely voluntary actions at this stage, all wafer starts from AMD beginning last week will no longer have the disputed microcode. It will take 10 to 12 weeks for chips without the unlicensed code to be released, according to an AMD spokesman.

While an elated Intel quickly filed a permanent injunction against AMD to stop it from shipping any 486 chips using the disputed code, analysts said the effect on AMD's bottom line — in the short term, at least — was debatable. Intel said it does not plan to ask for a recall of the millions of AMD chips already on the market.

"Intel can and will sue for damages, that's for sure," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz. But he said he doubted the company would be able to collect much because in almost all cases, AMD has disabled the disputed code and made it unavailable to users.

"What [AMD] did was kind of dumb, but it was not particularly heinous behavior," said Martin Reynolds, an industry analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif. He was referring to AMD's decision not to get rid of the code earlier.

"I don't see where Intel has been incrementally damaged by AMD's use of that code on its chips," he added. However, he said that would not prevent the company from seeking potentially crippling damages against its rival for 486 chips already in systems.

An AMD spokesman said that in the few cases where AMD used the code, it will rework the chips or destroy them.

As a result, AMD claims the potential for damages is limited because it did not benefit monetarily from the code, nor did it deprive Intel of any business.

"In 98% of the chips we have shipped so far, the code does nothing," the AMD spokesman said, adding that if the court granted Intel's injunction, it could set the stage for potentially substantial damages. "This is not about the code itself. This is about Intel trying to stifle the competition," he charged.

While users were noncommittal about the recent decision, most agreed that increased competition in the chip market is good.

"It's good to give Intel a run for its money every now and then. That's what keeps them on their toes," said Sean Gilbert, assistant manager of MIS at Cardservice International in Agoura Hills, Calif.

Legal matters

While AMD and Cyrix have racked up alliances with some of Intel's customers, Intel has been battling hard in the courts

MARCH 1994

Court awards AMD the right to use Intel code, meaning it will not have to produce 486s with clean-room microcode.

FEBRUARY 1994

Intel reaches agreement with IBM to keep sole legal rights to produce Pentium and agrees to pay Cyrix $5 million to settle battle over a licensing fee Intel tried to levy on Cyrix customers.

AUGUST 1991

AMD hits Intel with an antitrust suit seeking $2 billion. Suit accuses Intel of damaging AMD by trying to corner the market.

JANUARY 1991

Cyrix files suit against Intel, charging it with unfair business practices and antitrust violations.

AUGUST 1990

AMD wins the right to sell its Intel-equivalent 80C287 coprocessor.

IBM negotiations boost Apple stock

By Ed Scannell and Michael Fitzgerald

Apple Computer, Inc.'s stock rose dramatically last week amid persistent reports that the company was nearing an agreement with IBM on a common hardware platform that could run both companies' operating systems.

A second contributor to Apple's stock boost was a preliminary report issued by the company that said it expected to earn slightly more than 90 cents per share — some 25 cents to 30 cents more than most analysts had predicted. Analysts attributed the financial performance to sales of the company's PowerPC-based systems, which have higher margins than the company's lower-end machines.

Yet another factor behind Apple's fortuitous stock jump was rampant speculation that IBM and Motorola, Inc. were separately interested in taking an equity stake in the company and rumors that IBM and Apple were finally coming to agreement on the prickly process of establishing a PowerPC Reference Platform (Prep) standard [CW, March 21].

Spokespeople for both IBM and Apple said the companies are continuing talks to establish a common hardware platform but declined to comment specifically on the negotiations.

This new platform, which proposes to bridge significant differences in the companies' PowerPC-based hardware architectures, would be able to run versions of IBM's OS/2 and AIX as well as versions of Apple's Macintosh operating system on the same desktop system. Such a unified hardware front would bolster both companies' chances against the increasing desktop dominance of the Microsoft Corp./Intel Corp. combination. For users, the standard would likely result in lower hardware prices and a broader range of software choices on the RISC-based PowerPC platform.

So far, neither company appears able to drop its religious preferences and become more agnostic for the greater good, according to some observers. For instance, Apple has long been criticized for being reluctant to license its proprietary operating system to other hardware makers. More recently, it has been criticized for not selling off its less-profitable low-end lines and concentrating more on its high-end PowerPC-based systems.

"Apple's best bet is to license the operating system broadly and to abandon the low end of its hardware line to clone makers," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif.

Another issue appears to be that both companies' competitive fires still burn bright after 13 years. For instance, just last week, Lee Reiswig, president of IBM's Personal Software Products group, predicted that next year his company would sell at least as many copies of the soon-to-ship OS/2 Warp as Apple would Macintoshes.

"IBM and Apple's inability to separate themselves from their past is what is contributing to their getting their clocks cleaned," said one analyst, who asked not to be named.

An Apple official has said the differences between the current Prep standard and the Macintosh operating system are so great it would take "two years to port it to Prep" [CW, Sept. 19].

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Users get host options

Cisco, Cabletron set to take on IBM in channel-attach game

By Stephen P. Klett Jr.

Cisco Systems, Inc. and Cabletron Systems, Inc. are preparing to ship the first router and hub modules for directly attaching LANs to mainframes. In the process, they will set the stage for a wrestling match with IBM for account control in the channel-attachment market.

While it is unclear which vendor will be king of the hill, observers agreed that the struggle will spawn increased flexibility, performance and lower prices — all of which will make customers the clear winners.

Rochester, N.H.-based Cabletron will next week announce a LAN Access Control Module (LACM) for its MultiMedia Access Center line of hubs that will allow users to directly attach Ethernet and Token Ring LANs to SNA-based IBM mainframes. Developed with BusTech, Inc., the LACM will cost $18,995 and will provide a single bus-and-tag channel connection to a mainframe. An Escon version will ship in January, company officials said.

Escon refers to the architecture used to connect devices to IBM's newer ES/9000 mainframes. Bus-and-tag is the connection method used with previous models.

High-speed connector

Meanwhile, amid reports of possible IBM patent infringement troubles, Cisco will ship an interface card for its 7000 and 7010 routers in December that will provide a direct, high-speed connection between mainframes and routed internetworks.

Each Channel Interface Processor (CIP) card will provide up to two mainframe connections. Escon versions will ship starting at $28,000. Bus-and-tag versions will follow in January.

"User interest in products like these is very high because the mainframe has to be able to live in a multiprotocol environment today," said David Passmore, president of Decisis, Inc., a consultancy in Herndon, Va.

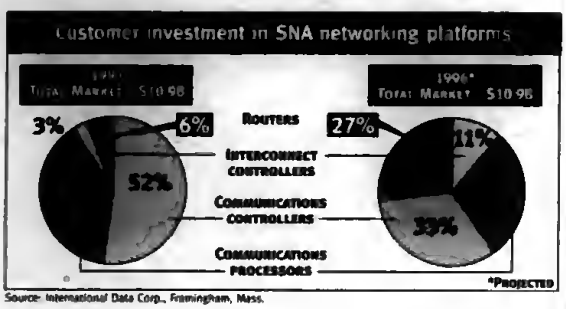
Now, attaching mainframes to LANs can involve three separate IBM devices: a 3172, which converts LAN traffic into SNA and vice versa; a cluster controller that gathers SNA terminal data to send to the host; and the 3745, which performs SNA routing at the mainframe level.

Both the CIP and LCAM were designed to obviate the need for users to have a separate IBM 3172 front-end processor to perform protocol conversion and TCP/IP pass-through functions. The benefit to users is greater simplicity and neater packaging, which could lead to cost savings in many cases.

"We're testing the CIP as a means of bringing IP traffic into our mainframe without having to buy a 3172," said Bruce Almich, manager of data communications at the Environmental Protection Agency in Research Triangle Park, N.C., which plans to roll out upwards of 80 Cisco 7000 and 7010 routers in the next seven years.

Almich said the EPA may use the CIP to replace its "outdated" IBM 3720s, Netrix Corp. frame-relay switches, various Vitalink Communications Corp. Ethernet and Token Ring bridges as well as incorporate Novell, Inc. IPX routing into its 7000s in a collapsed backbone configuration. "We think this will certainly result in a cheaper alternative than buying 3172s," which can cost about $50,000 fully configured, Almich said.

While still a cash cow for Big Blue, front-end processor sales in general are in a steady state of decline (see chart), and Cisco and Cabletron will only put more pressure on IBM to maintain its leadership position, analysts said.



Source: International Data Corp., Framingham, Mass.

Meanwhile, other users expressed cautious optimism about attaching third-party routers and hubs to their mainframes.

"This gives us more of an opportunity to become more vendor-independent when going from the LAN to the mainframe," said Don Cleavinger, director of the network technology and strategy organization at Electronic Data Systems Corp. in Plano, Texas. EDS is testing the Cisco CIP card as a possible replacement for an IBM 3172 controller.

Yet with an SNA network of more than 60,000 devices and more than 20,000 LAN segments, EDS does not plan to jump onto the Cisco bandwagon rashly. "When you have a large SNA environment like we do, you don't just drop something in without a good idea of what it will do. If Cisco's router ever gets blamed for hanging the mainframe, the mainframe people will never forget it," Cleavinger said.

Big iron moves

Cisco plans to ship software early next year that will allow users to off-load TCP/IP conversion processing from the mainframe. Support for mainframe SNA applications and Advanced Peer-to-Peer Networking will follow around the middle of next year, company officials said.

Meanwhile, IBM denied reports that it planned to sue Cisco over alleged patent infringements regarding the router vendor's channel-attach strategy.

"However, we don't intend to lay down and let any competitor come in and own the channel-attachment business and replace our controllers," said Bob Kennedy, product manager for IBM's 3172 controller line.

Wellfleet's low-end routers let users scale-up networks. See page 67.

SQL Server price cut by nearly 40%

Users gain flexibility but question savings

By Stuart J. Johnston and Kim S. Nash

Microsoft Corp. wants to have it both ways — to be the low-price leader and significantly increase profits from its server products.

The company last week said it is already lowering the recently announced prices for its SQL Server software by nearly 40%. Additionally, it is offering customers the option of assigning client licenses to individual PCs or designating them as concurrent-use licenses on a specific server.

Under the new prices, the SQL Server license will now be $995, down from the $1,495 announced last month. Client licenses will drop to $149 from $189 per unit, or to $119 if bought in groups of 20 or more.

On the back end

However, the company is not likely to change the pricing on the other elements of its BackOffice server suite, said Rich Tong, general manager for corporate and network systems.

Earlier this month, Microsoft executive Steve Ballmer alerted customers in New York that the company was rethinking pricing for its server products. Microsoft encountered resistance to the pricing it announced last month [CW, Oct. 10].

"That's terrific. I'm glad to see there was some influence [from users] there," said one large user at a company Microsoft has touted as a Windows NT poster child.

But even with the cuts, the prices are still higher than they were before the new prices announced last month, especially for large users. Microsoft, however, argues that large installations are likely to have multiple servers, which makes its new "per-user" pricing more economical than concurrent licensing models.

The latest price changes are meant to give customers the kind of flexibility that user applications require, said Gary Voth, group product manager at Microsoft's Business Systems Division. As servers are added to the network, customers also have the ability to reassign client licenses, on a one-time basis, from concurrent usage on a specific server to individual users' desktops, he said.

Microsoft executives argue that making the server products more profitable will be a gain for users in the long run. This is because increased profitability will provide financial incentive for resellers to support the products the way users of competing server products have become accustomed to.

Flexibility may help

Adding flexibility in how to assign client licenses may indeed help break down resistance to the higher prices, according to some users.

"We might give most users access to a SQL Server human resources application so that they can request vacation times," said one major Windows NT user at a transportation industry firm on the West Coast, who was incensed when Microsoft first announced its per-user licensing scheme last month. "But to pay big seat prices for 1,000 users would be crazy," said the user, who was much relieved by the turnabout.

Perfect pricing

Microsoft's SQL Server pricing vs. Sybase Workgroup SQL Server

	Microsoft	Sybase
8 users	$2,187	$3,595
16 users	$3,383	$5,595
32 users	$5,187	$9,595
64 users	$8,207	$14,995
100 users	$12,383	$19,995

Source: Microsoft Corp., Sybase, Inc.

Price competition

In fact, the low-end server market appears to be turning into a price-slashing war. Just last week, Sybase, Inc. brought out its Workgroup SQL Server pricing, which it touted as being lower than Microsoft's [CW, Oct. 10].

Now, Microsoft has once again turned the tables. Oracle Corp.'s Workgroup Server has also been undercut.

But price cuts and added flexibility, however significant, are not likely to win Microsoft SQL Server many long-term contracts from most high-level information systems managers, according to Laurence Fong, an analyst at Southcoast Capital Corp., a brokerage in Austin, Texas.

MCI, Sprint still waffling on wireless

By Ellis Booker

The wireless industry resembled a frantic game of musical chairs last week, as MCI Communications Corp. was reported close to signing a merger agreement with Bell Atlantic Corp. and Nynex Corp.

Just days earlier, Sprint Corp. reportedly broke off alliance talks with Bell Atlantic and Nynex, which earlier this year announced plans to merge their cellular operations.

Sprint is now said to be negotiating with a list of cable companies — Tele-Communications, Inc. in Denver, Cox Enterprises in Atlanta, Comcast Corp. in Philadelphia and Continental Cablevision in Boston — with an eye toward creating a cable/telephone offering that could use wireless technology through Sprint's cellular arm.

Sprint acquired cellular properties from Contel Corp. in 1992 and has the fastest-growing business, with 750,000 customers, analysts said. By comparison, McCaw Cellular Communications, Inc. has about 3.3 million subscribers.

MCI would neither confirm nor deny the reports, and Sprint could not be reached for comment.

Lean on who?

For end users anxiously trying to pick a wireless data technology and a carrier to get it from, the jockeying for position was not well-received.

"It's a concern to me to the extent that it'd sure be nice to know who we can count on when we're ready to deploy wireless notebooks in a year," said Sam Nash, telecommunications manager at Associated Grocers, Inc., a grocery wholesaler in Seattle.

The seeming fickleness of MCI and Sprint may be helping mutual rival AT&T Corp., which despite some regulatory hurdles, has gone forward with its acquisition of McCaw Cellular.

"Of all of them, AT&T/McCaw seem the most stable," said Ameet Patel, manager of advanced technologies at BASF Corp. in Parsippany, N.J. While waiting for a cellular digital packet data network, BASF is testing a wireless nationwide network with Ram Mobile Data in New York.

The activity last week may be connected with an Oct. 28 deadline from the Federal Communications Commission. The FCC wants to know about alliance partners in advance of its December auction of personal communication services (PCS) broadband wireless spectrum licenses.

The bidding is expected to be intense for the coveted licenses, and many analysts figure the FCC will fetch more than $10 billion in the process.

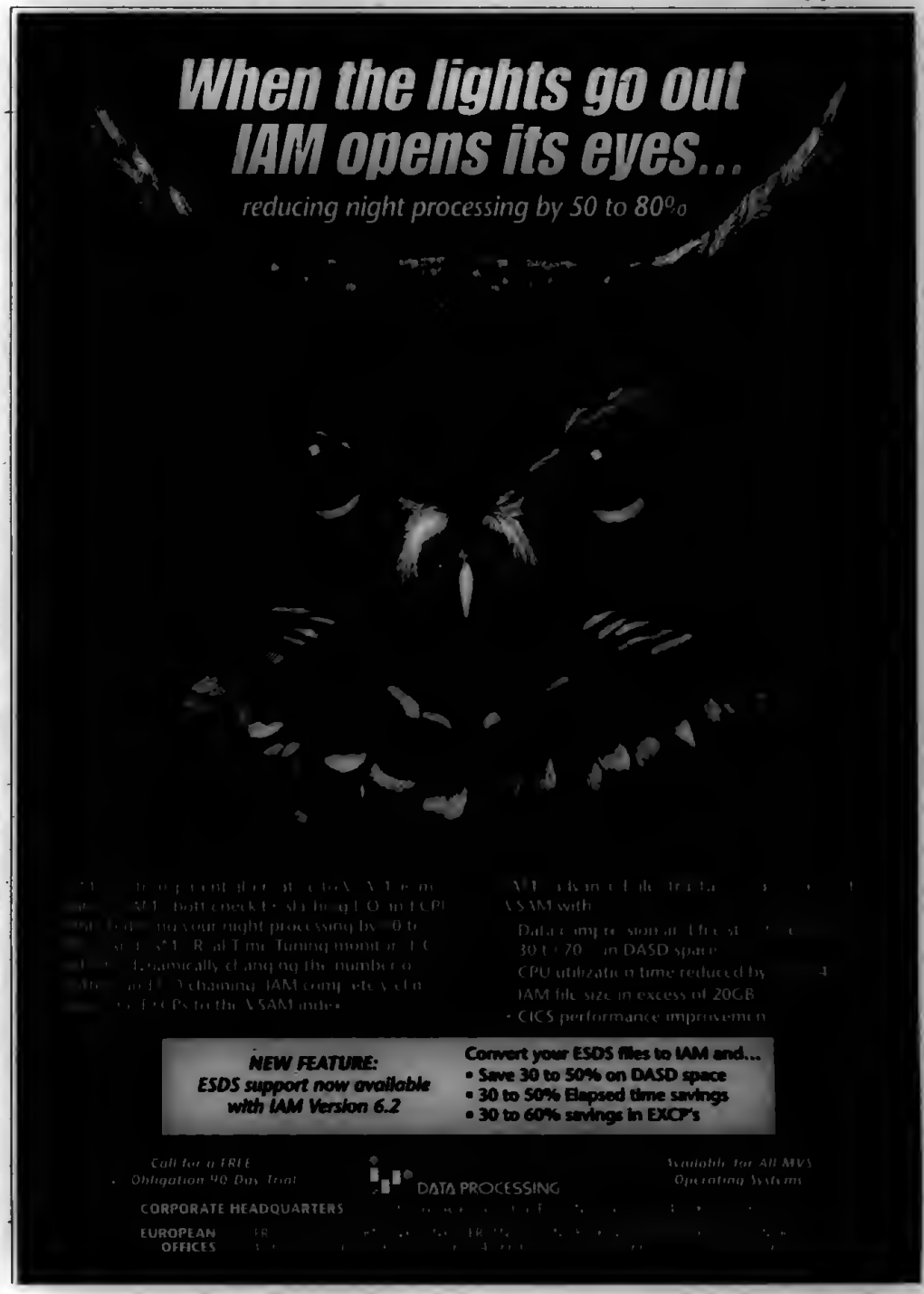
But expectations about PCS may be misplaced, according to Patel. "The real key is what are users going to do for the next six years," he said. Patel said migrating from his short-term wireless service to PCS is critical for his company.

Indeed, whatever the outcome of the December PCS auction, it will be some time before services arrive.

Whereas the narrowband spectrum auction in July may result in services by the end of next year, "broadband PCS won't see services before one year to 18 months after that," said Iain Gillott, manager of wireless communications at Link, an International Data Corp. company in Framingham, Mass. Moreover, PCS services will be limited to major markets first and will not begin as a national service.

Karen Scherberger, research director in the applications solutions center at Gartner Group, Inc., called the current chaos "growing pains." She said creating alliances between long-distance and local-exchange carriers is difficult because the two increasingly compete with each other.

But Tom Nolle, president of CIMI Corp. in Voorhees, N.J., said one casualty of a prolonged "mating dance" among carriers working out their wireless strategy could be the loss of public confidence.



News Shorts

DEC restructuring hits $1 billion mark

Digital Equipment Corp.'s restructuring costs will reach $1 billion in fiscal 1995, according to the company's recently issued 1994 annual report. Restructuring costs were $1.2 billion in the fourth quarter of this year, ended July 2. Those costs included 20,000 job cuts, 40% of which were in sales and marketing. Chief Executive Officer Robert Palmer promised profitability for fiscal 1995 and backed off from earlier assertions of calendar 1994 profitability.

IBM unveils 3½-in. disk drives

IBM introduced its new family of hard disk drives last week, including the industry's highest-capacity 3½-in. drives, at 10.8G and 8.7G bytes. Both will be available in the second half of next year. The drives use magneto-resistive (MR) head technology. Other MR-based drives are expected from **Quantum Corp.**, which will add a 1G-byte MR drive to its product line, and **Hewlett-Packard Co.**, which will introduce its first MR drives Oct. 24.

Intel inks multimedia deal

In an effort to make multimedia features cheaper and more universal, **Intel Corp.** will tomorrow announce it has signed an agreement with Spectron Microsystems to bring its SPOX operating system to the Intel architecture. IA-SPOX will let Intel's Pentium chip bundle native signal processing such as audio, reducing the need for pricey add-in cards.

PC, Unix server standard nears

IBM announced its support last week for the **Desktop Management Interface** (DMI) within its ADX platform, signaling that users now have a single standard for integrated, remote management of desktop PCs and Unix servers. Separately, The Desktop Management Task Force (DMTF) last week launched a user advisory council to allow users to influence the future direction of the DMTF and its DMI standard for management of LAN-attached PCs.

AST Research loss anticipated

AST Research, Inc.'s troubles seem to be deepening. The company last week warned investors it expects to post a loss of approximately $40 million on revenue of $495 million for the first quarter of fiscal 1995, resulting in a net loss of between $1.20 and $1.25 per share. AST also said it will close its Fountain Valley, Calif., manufacturing facility and lay off about 440 employees from that location. The cutbacks are part of a planned companywide work force reduction expected to eliminate approximately 10% of AST's 6,900-strong staff.

SHORT TAKES The just-returned space shuttle Endeavor used a fault-tolerant PC from Houston-based Texas Microsystems, Inc., which featured redundant hard disks, error-checking routines and a power-protection subsystem, to control an experiment on the effects of weightlessness on plants. . . . **Metropolitan Life Insurance Co.** last week named James M. Logan as senior vice president and chief information officer. He was previously vice president of group insurance operations. . . . **SunSoft, Inc.** said it will ship Wabi 2.0, the second major release of Sun's Windows-on-Unix interface, as part of its Solaris 2.4 operating system this quarter. . . . **Apple Computer, Inc.** has appointed Apple veteran Shane Robison as vice president and general manager of the Personal Interactive Electronics Division, which is responsible for developing and marketing Newton.

Crucial OMG vote looms

Group considers dueling proposals for object interoperability

By Jean S. Bozman

The Object Management Group (OMG) is set this week to take a crucial vote on the Common Object Request Broker Architecture (CORBA) 2.0 object interoperability standard against a backdrop of battling vendor camps aligned behind two technically different proposals.

The combatants played an elaborate game of poker all week before reaching for a last-minute compromise on a standard object request broker. Users said the confusion created by the debate might slow their move to distributed object computing.

Without such a standard object request broker for all vendors, worldwide distributed computing would remain an amalgam of point-to-point client/server links. A universal standard would free users to send data requests to any server on an enterprise network, just as any telephone caller can reach any other in the world.

What's it gonna be

At issue is the OMG's consideration of two proposals: One is based on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) remote procedure calls and is backed by Digital Equipment Corp., Compaq Computer Corp. and IBM. The other, from the Universal Networked Objects coalition, is based on "lightweight" protocols suited for PCs and personal digital assistants.

Proponents said that bypassing DCE will create a second infrastructure for distributed computing.

"We don't want the vendors reinventing the wheel," said Ted Hanss, chairman of the OSF's end-user steering committee.

"We don't want to have to reinvent our distributed computing base or to introduce a duplicate environment just to support distributed object computing," said Hanss, who runs DCE at the University of Michigan at Ann Arbor.

Large sites now evaluating or deploying DCE see the OMG vote as a threat to the status quo. "We are at a critical juncture in the [computer] industry right now," said Bill Estrem, a project leader at 3M Co.'s information architecture department in St. Paul, Minn. Estrem, who is evaluating DCE, is a member of the OSF end-user committee. "The decision that gets made will basically shape the outcome of whether or not CORBA is going to be relevant or irrelevant."

The proposal from the Universal Networked Objects coalition, backed by SunSoft, Inc., several Sun partners and IBM, is designed to broaden the reach of distributed objects to all types of devices on the network — not just large enterprise servers.

Richard Soley, the OMG's technical director, said IBM was on both sides, and that it was trying last week to arrange a merger of the two approaches to CORBA 2.0, which is key to IBM's object strategy.

"Clearly, they've supported DCE for a very long time," Soley said, "but I think they're covering their technical bases."

Critics allege that DCE's roots are in procedural, not object-oriented, code and that DCE is too complex. "We want to be able to interconnect all types of client machines. We have to lower the barriers so that [the code] can fit easily on PC clients," said Geoff Lewis, business development manager at SunSoft's Project DOE (Distributed Objects Environment) group.

Last week, the pro-DCE group upped the ante by making key DCE modules available — even on the Internet — with free licenses. Yet by week's end, the group led by SunSoft had extended an olive branch with an offer to merge the two technologies and avert user confusion. The vote of the OMG's Object Request Broker 2.0 Task Force in Nashua, N.H., this week is expected to draw some 60 to 80 people, including independent software vendors and users.

All in due time

But some users remain unconvinced that any standard that emerges will bring immediate results. "We users have been chasing future technology for so long and haven't seen any real impact," said Catherine Howells, manager of standards and measurements at DHL Worldwide's DHL Systems group in Burlingame, Calif.

"Don't tell me what ice cream is," she said. "Give me ice cream."

IBM puts on the brakes

IBM last week slowed down the bridge-building efforts between the two major object computing standards, according to sources close to negotiations within the Object Management Group.

In a move that some observers said is intended to undermine Microsoft Corp., IBM officials are proposing that a planned link between the OMG's CORBA standard and Microsoft's Common Object Model (COM) be included in the CORBA 2.0 interoperability specification instead of in a separate standard.

IBM officials said their proposal could provide broader, more general interoperability between CORBA and other object technologies. Yet some observers suggested IBM may be trying to challenge Microsoft's grudging support for a standard link between COM, the model for its own Object Linking and Embedding standard, and CORBA.

The flap could delay the OMG's critical process of establishing industrywide object standards. Current implementations of CORBA cannot interoperate with one another, and the OMG must settle vital wire protocol issues with CORBA 2.0 as soon as possible.

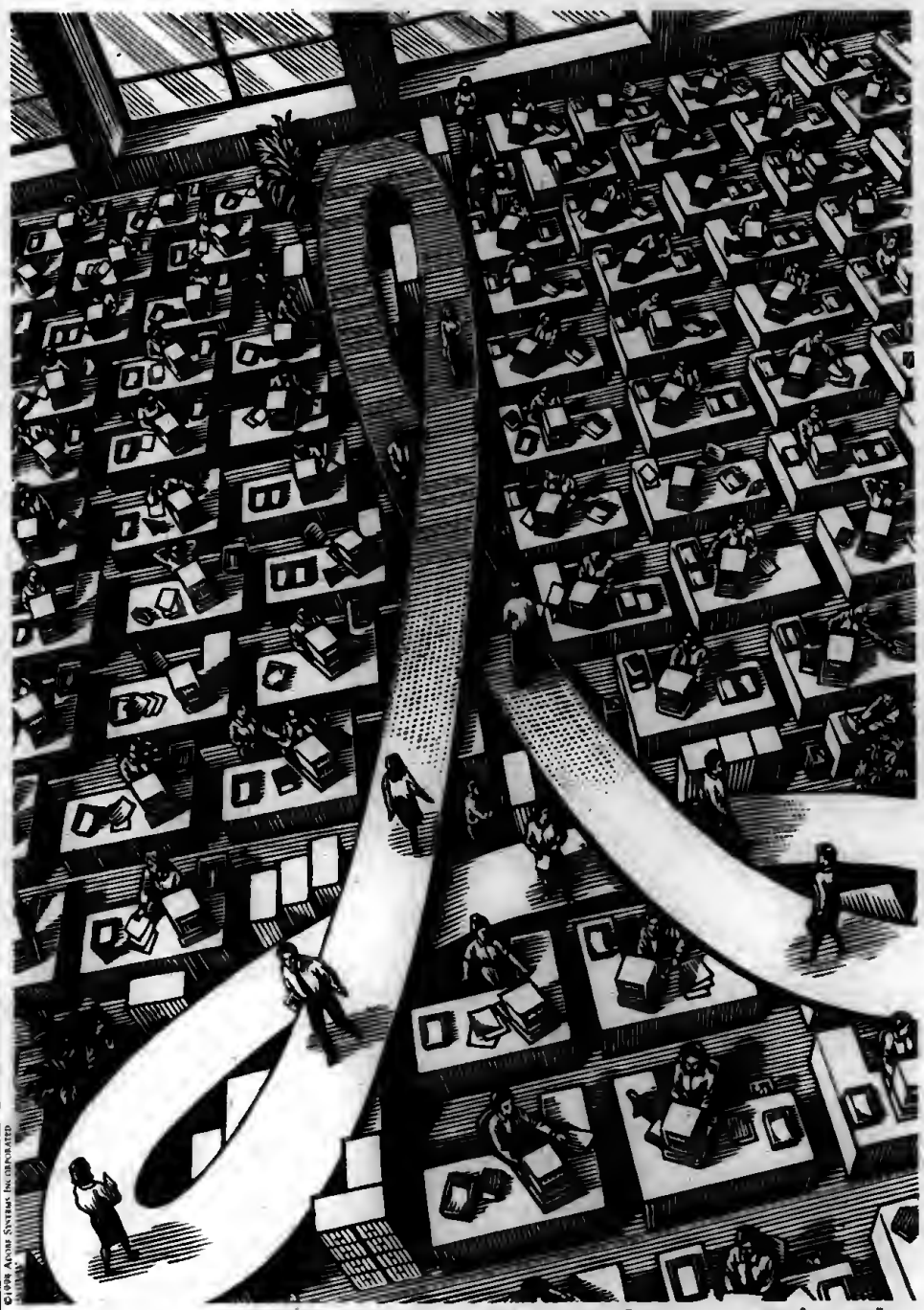
"We want COM-to-CORBA interoperability, but we'd like it to be part of a more general model for how CORBA will be linked to non-CORBA objects," said Cliff Reeves, IBM's director of object technology products. "It's the difference between putting a wire between your house and mine and setting up a phone system that would let you communicate with everyone."

Reeves said IBM will seek a vote this week to rescind the request for proposals for a separate interoperability standard between CORBA and COM, which the OMG voted to adopt last August [CW, Sept. 5]. If that IBM effort fails, the OMG will put out the proposal request this week, seeking technology to meet that need. IBM will support the end result of such a vote, Reeves said.

— *Melinda-Carol Ballou*

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DEC's Alpha revamp marches on

By Mary Brandel

Digital Equipment Corp. will further revamp its Alpha AXP servers next month, extending PC-like components and multiprocessing to workgroup nsers.

But don't look for the "DEC" label here: Digital will drop that nomenclature as it did on its PCs last month. Servers will now be called AlphaServers and workstations will be AlphaStations.

The single- and dual-processor servers — which will be introduced Nov. 3, according to a source close to the company — will continue what Digital started with its spring release of the highly regarded four-processor DEC 2100 departmental server (see chart).

The 2100 is best known for its use of Peripheral Component Interconnect (PCI) technology, good symmetrical multiprocessing scalability and low price/performance ratios.

The announcement "will flesh out Digital's modular computing strategy and will add a lot of momentum to the success they're currently having" with the 2100, said Terry Shannon, an analyst at Illuminata in Hollis, N.H.

At least one user readily saw a need for the lower-end boxes. The key is whether "they can position the boxes with a little less performance at substantially lower prices," said David Sacco, MIS manager at the rolled products division of Alcan Aluminum Corp. in Cleveland.

Digital's server blitz will include:

- The AlphaServer 1000, a single-processor, PCI-based server running at 190 MHz to 200 MHz.
- A single- to dual-processor PCI-based Alpha system running at 190 MHz to 200 MHz.
- An upgraded 2100 server based on the 21064A chip and running at 275 MHz.
- The DEC 7000 Model 700, a 275-MHz six-processor SMP system based on the 21064A Alpha chip.

Pricing has not yet been set, but Shannon said the single-processor server would likely cost $12,000 to $15,000.

Focusing on PCI is "a good move on Digital's part from a manufacturing cost point of view," said Paul McGuckin, an analyst at Gartner Group, Inc. in Santa Clara, Calif. PCI enables vendors to take advantage of commodity PC boards for I/O and peripherals.

"The snagging point is that device driver support won't be universally available," he added. "If a PCI company comes out with a board that runs on Windows, that doesn't guarantee that you can plug into a Unix-based machine."

Speed counts

But the speed of PCI is what prompted Raymond Vijil at the New Mexico Department of Public Safety to buy an Alpha server. Because it is "tremendously fast," it allows the department's criminal information system to meet requirements set by the FBI to get data to field officers in 10 seconds.

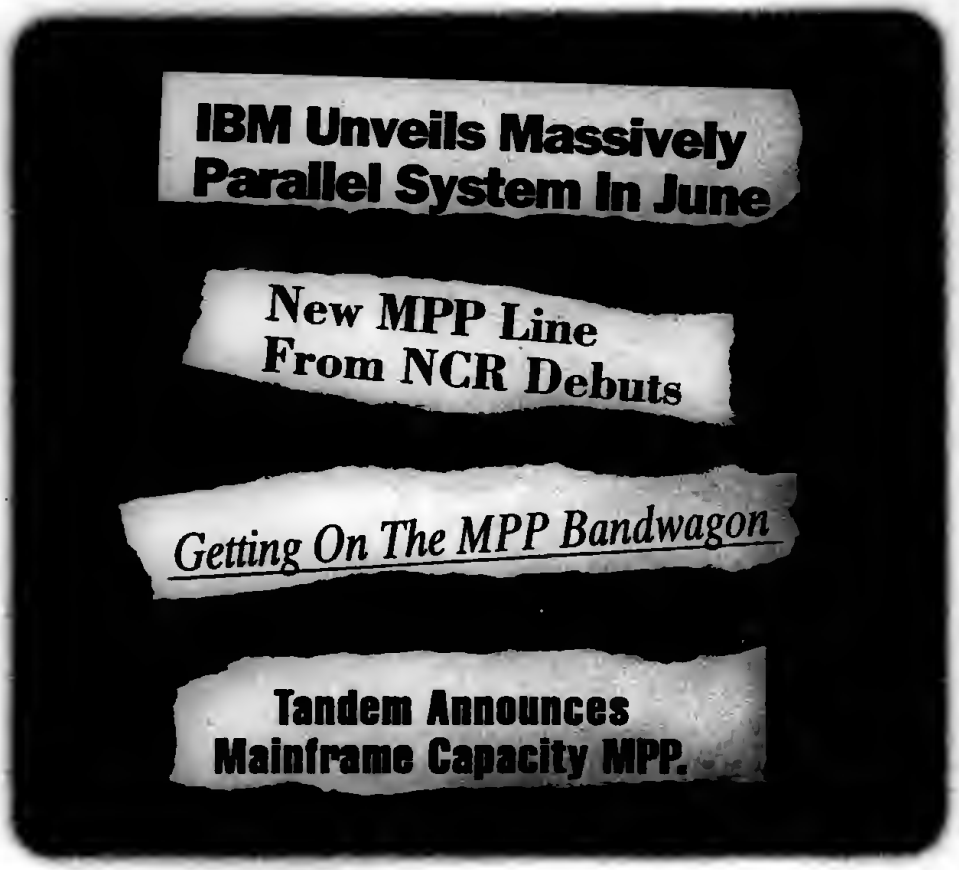
Vijil said he bought nine four-processor 2100s. But for the district sites, "we probably would have gone with a smaller device had that been available with the same architectural design," he said.

Shannon said a revamp of the 7000-class enterprise servers is likely for the first quarter of calendar 1995.

That is not a problem for Sacco. "We can't entertain moving to Alpha at the enterprise level because our database vendor has not ported its database," he said. Cincom Systems, Inc.'s Alpha version of Supra is in beta testing, he added.

Also missing is an under-$5,000 Alpha-based desktop machine. However, "Digital has clearly stated that it's not competing with Pentium on the Alpha line," Shannon said. At least two workstations will be introduced as well.

How well the announcement is received may be determined by Digital's financial results, expected on Oct. 19. Analysts are forecasting a loss of $1.50 per share, compared with $1.14 last year.



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Novell recasts enterprise licensing paradigm

By Elisabeth Horwitt

Just like its rivals, Novell, Inc. is getting plenty of pressure from its users to recast its pricing structure to better reflect the realities of enterprise client/server computing.

While refusing to give details, Novell spokesman William Donohoo said the firm is in the process of hammering out a "networkwide" licensing scenario tied to NetWare Directory Services (NDS).

The company is also "seriously considering" usage-based pricing under which users would be metered on how long and how often they accessed particular services, and the company would charge accordingly, Novell spokesmen said.

Trying it out

However, while Microsoft Corp. and Banyan Systems, Inc. have already begun testing market waters with pricing revamps, Novell officials said users will not see an enterprise pricing model for NetWare until late next year at the earliest.

Novell may have the right idea, given that users have been using its rivals' trial balloons for target practice [CW, Sept. 26]. Also, putting together a successful enterprise pricing model is about as complex and politically volatile as the universal health care initiative, Novell spokesmen and analysts agreed.

The entire client/server industry — not just Novell — must find ways to measure and price "occasional usage" patterns that crop up in enterprise networking, said Glenn Fund, president of the Boston Area Novell User Group and manager of networking at a major engineering company.



The downside to Novell's slow-and-steady approach to a pricing revamp is that all but the biggest of Novell's customers will have to purchase NetWare 4.1, when it becomes available in December, through the old server-centric 3.x pricing plan. This older model prices each server license based on how many users concurrently access that server.

The old approach to pricing will severely curtail users' ability to freely access services enterprisewide, independent of which server they reside on, said Erik Dauplaise, a network administrator at Duracell, Inc.'s worldwide technology center in Needham, Mass.

The problem is that while NDS technically provides that freedom, information systems staff will have to pull in the reins every time the total number of users on a given server threatens to exceed the licensing agreement, he added.

What Novell needs is a plan that charges according to the total number of users on the corporate network, as usage patterns dictate, Dauplaise said. "So that if I had a 1,000-user license, 900 users could be accessing one server and 100 users the other" or vice versa, he said.

Concurrent pricing also forces companies to pay for the number of users accessing a server during peak times but does not compensate them for the valleys that occur in between, said David Cearley, a vice president at Meta Group, Inc., a Westport, Conn., consultancy.

Furthermore, the peaks and valleys are likely to become more numerous and less predictable as companies move to what Novell calls network-centric computing. Instead of being tied to one or two servers for their computing needs, users will hop around the network from, say, a NetWare for Systems Application Architecture gateway on one server to a database on another.

Several user and analyst sources cited usage-based pricing as a promising way to deal with this scenario. Novell is evaluating it with a wary eye on potentially explosive issues such as how to work it through existing value-added reseller channels, Donohoo said.

In addition, Novell is working on technology for metering usage of networked applications across the enterprise. The offering should come out around the time Novell introduces its new pricing structure, the spokesman said.

Such a metering system would be a godsend for companies such as Texaco, Inc. The Houston-based energy firm already does usage-based chargeback internally for mainframe applications and is interested in doing the same for client/server applications, said John Murphy, a director of IS at Texaco.

Not an choice

One option that Novell will definitely avoid is the per-node or client-based model that Microsoft uses for its Windows NT server, Donohoo said. In this scenario, companies pay a set license fee per client, with basic NT file and print services as part of the price. Additional services, such as Remote Access and SNA Server, cost extra.

Novell considers this scenario "too cumbersome," Donohoo explained, because it requires IS to keep "going back to the well for additional licenses" each time new users come on board.

Vendors to lighten up

CONTINUED FROM PAGE 1

updated bimonthly.

Furthermore, Novell is expected in the near future to introduce metering technology that will enable users to measure software usage. A Novell source said the company would introduce the capability in its November announcement.

The program will go into effect in December, said Ron Heinz, vice president of major market sales at Novell. "It will be similar to the Microsoft Select program," he added.

Microsoft's Select program — whose lead other vendors are following — is a multitiered program that enables users to distribute software from a CD-ROM server. Users pay an up-front cost based on the number of desktops at their sites. Additional licenses are reported to Microsoft via a reseller at the end of each quarter.

Microsoft will reduce the reporting requirement to a one-time transaction in Version 3 of Select, said Craig Fiebig, director of organization licensing at Microsoft. That version is expected to roll out in the first quarter of next year.

Novell sources said the company will require its enterprise program users to report license purchases on a monthly basis. Lotus Development Corp.'s Passport program, which is similar to Microsoft's Select, requires users to report software distribution only on an as-you-copy basis.

With Novell entering the fray, all the major desktop software vendors — Microsoft, Novell and Lotus — will now offer their products to corporate users via enterprise-level software programs.

By coupling CD-ROM technology with enterprise volume agreements, users can expect discounts of at least 20% to 50% off software costs, according to vendors and resellers.

However, while these programs offer savings, users have found the compliance and reporting requirements to be burdensome. Also, the lack of metering products to track usage has left many sites overlicensed. Gartner Group, Inc. estimates that most companies pay for at least 20% more software than they use (see related story above).

"The biggest headache we have right now is tracking registrations," said Michael McSorley, information systems manager at McCarthy Building Co., an international building concern in St. Louis. His company uses Novell's NetWare and Microsoft's Office suite at its sites.

"We don't have an enterprise license deal with either vendor now," McSorley said. "But if they make it easier, we're interested."

Facing the issues

For now, all the major vendors are ready to address at least the reporting requirement. For example, Microsoft not only requires users to report how many licenses they are buying at the time of distribution, but also mandates that they file an updated software usage report at the end of each quarter.

While customers applauded the easier reporting requirements and software loading and distribution capabilities that CD-ROM technology brings, some said the vendors still fall short in some key areas.

For example, while McSorley said he would probably move to an enterprisewide agreement to take advantage of the software discounts, he would prefer to pay only for the software he actually uses. But he conceded that this would not be possible for a multinational company until tools to meter actual software usage are available.

Another user said the new program represents yet another market offering with more requirements.

"It'd be nice if the vendors could just offer one uniform set of reporting standards," said Andrew Fugate, data processing manager at Price Edwards & Co., an Oklahoma City-based property management firm.

Microsoft buys Intuit, key financial software

By Stuart J. Johnston

Once again last week, Microsoft Corp. decided to prove that "if you can't beat 'em, buy 'em," when it announced it is purchasing Intuit, Inc. in a stock exchange deal worth about $1.5 billion.

"It's the largest software transaction that's ever been [made]," said Bill Gates, Microsoft's chairman and chief executive officer, who cheerfully admitted he had initiated the deal.

The bad news for Microsoft Money users, however, is that Microsoft is selling that product to Novell, Inc., partly to ward off any raised eyebrows at the Department of Justice. Intuit makes Quicken, the extremely successful checkbook and home financial management product.

Quicken's market position has been untouched by Money, which entered the market well after Quicken was established as the standard. Quicken has 6 million active users in the U.S., Intuit Chairman Scott Cook said last week.

Good things to come

Both Gates and Cook said they believe the deal will not result in layoffs but instead will create demand for more employees, especially as demand for on-line banking services and electronic filing of tax returns expands. Intuit dominates those areas now.

Bill Campbell, Intuit's CEO and president, will head Microsoft's new financial products division, which will include the Intuit operating units.

Unlike other Microsoft acquisitions, Intuit will retain its name and brand identity, the companies said.

In the stock swap, each Intuit share will be exchanged for 1.336 shares of Microsoft stock. Intuit shareholders will get at least $71 per Intuit share in Microsoft shares.



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Platinum pulls back from brink

By Rosemary Cafasso
PALM SPRINGS, CALIF.

Just a few months ago, Platinum Software Corp. had a very good shot at becoming the first high-profile failure in the client/server applications market.

All the necessary pieces were in place: disastrous financials, a stock price in the toilet, executives dropping like flies, and most alarming, an admission that it essentially recorded revenue before it had actually earned it.

But last week the company sketched out a new product strategy at its annual user conference that called for a refocus on financial software and delivering versions targeted at firms of various sizes.

Teetering

Platinum's new management team has been hard at work to clean up the company and now confesses that the financial picture was bad enough in April that "if no immediate action was taken, it would have been 60 to 90 days to Chapter 11."

The right path

"I think they've really gone a long way in a short period of time," said Mike Huiatt, manager of financial systems administration at Tesoro Petroleum Corp. in San Antonio. "People aren't beating their door down, but they are still tapping lightly to see what they have."

The product strategy follows several months of effort by Platinum to pull away from disaster. Other steps included getting rid of extraneous business interests and associated staff, cleaning up its financials to accurately reflect revenue earned, settling a class-action lawsuit and garnering $13 million from a group of investors led by Kleiner, Perkins, Caufield & Byers.

The financial software product line will include the following:

- SQL NT, which will run on Microsoft Corp.'s Windows NT platform. It is a scaled-down version of its current SQL to Platinum client/server software that has fewer functions and limited development tools. Scheduled for an official announcement early next year, SQL NT will target midsize companies. Pricing has not been finalized but is expected to fall in the $5,000 to $10,000 range.
- SQL to Platinum was renamed SQL Enterprise to better target large companies. High-end users will get full functionality and pay the current price of about $20,000 per module.
- At the low end, Platinum will offer a Windows-based follow-on for its Platinum LAN users. It is on schedule to ship next year for about $1,000 to $2,000 per module.

One complaint raised at the conference concerned technical support. A few users noted a recent drop-off in the quality of telephone support but suggested it was fallout from the chaos of earlier this year.

"I think they are going in the right direction, but they have a ways to go," said Robert Shaffer, a senior technical associate in the information systems division at Calgon Corp. in Pittsburgh. "Phone support is still weak. I think they are getting back on their feet, and it will take time."

Hackers stay a step ahead

By Gary H. Anthes
BALTIMORE

An array of new Internet security tools took center stage last week at a national computer security conference where experts cautioned that neither vendors nor users are doing enough to win the war against computer hackers and viruses.

"We should be making bigger improvements," said Stephen T. Kent, chief scientist for security technology at Bolt, Beranek and Newman, Inc. "From the standpoint of deploying technology, we are definitely not staying up with the bad guys."

Nevertheless, Kent and others praised a new product from Secure Computing Corp. in Roseville, Minn., which was unveiled last week at the 17th National Computer Security Conference.

Sidewinder, an Internet gateway, uses trusted operating systems principles developed in the mid-1980s for the U.S. Department of Defense's "Lock" project to protect highly classified networks. Sidewinder extends the capability of traditional firewalls, which are computer gateways that can examine and block data packets moving between the Internet and private corporate networks.

The adequacy of firewalls was debated at the conference. John P. Wack, a computer security specialist at the National Institute of Standards and Technology, said that for $15,000 to $20,000 a company can buy a firewall that "puts you ahead of what hackers can do to penetrate a system."

"If you don't have a centralized firewall, you have to maintain all your systems at a high level of security, and that's very difficult," Wack said.

Break-in heaven

Of the computer crimes investigated last year by the FBI, 80% involved unauthorized access to computers by hackers on the Internet, according to the Computer Emergency Response Team at Carnegie Mellon University in Pittsburgh.

He also pointed out that two excellent firewall software packages are available on the Internet as freeware.

However, Wack cautioned users not to expect too much from firewalls. "Can I firewall against viruses?" he asked. "If I could do that, I could cure cancer."

Kent said vendors do not yet offer good tools for managing the security of large heterogeneous systems.

But Kent noted that as firewalls become more sophisticated in their ability to screen out mischief, they also become more difficult to set up and maintain and more likely to degrade network performance.

Wack said government information systems managers are increasingly being told to connect their agencies to the Internet to better serve the public, but they are not always security savvy. "They should be told to get a firewall," he said. "Some agencies are wide open."

Multimedia apps filler, not killer

By Suruchi Mohan
SAN FRANCISCO

Long known for its hype and flashiness, the multimedia industry seems to be settling into a resigned middle age — long before it ever reached adulthood.

At the Multimedia Expo here last week, industry heavyweights acknowledged that the technology has outpaced user needs and that the so-called killer application required to put multimedia on every desktop in the enterprise is not here yet.

> "Everyone is fixated on 500 channels right now, and we're numb about that [because] everyone has heard about it for so long."
>
> — *Simon Langdon, director of business operations, Dow Jones & Co.*

The past few months have seen great activity in the multimedia arena, with the unlikeliest of partnerships being formed among telecommunications, cable, networking and much-publicized entertainment companies. While all have promised unified access to a wide range of services, speakers at the conference referred to all these services — home shopping, video on demand and games — as more "fillers" not killers.

"There is no killer app," said Larry Kasanoff, chief executive officer of Threshold Entertainment in Los Angeles. "What will drive the interactive market is entertainment."

Supply lacks demand

While disagreeing that entertainment will be the driver, Robert Hitchcock, president and CEO of Datavision Technologies Corp. in San Francisco, noted that the much-touted home shopping applications attract only 6% of home buyers. Hitchcock said he expects customized applications to grow and envisions them being financed by those who would best be served by getting a particular message across. For example, an application dealing with an individual's personal finances would be subsidized by a financial firm such as Merrill Lynch & Co.

Users also say there is no driving need that propels multimedia.

"Everything we could do with multimedia we can accomplish in some other form today," said Clifford John, a telecommunications specialist at Ford Motor Co. in Detroit. "[Multimedia] must make us more efficient or productive." Multimedia is still too expensive to be deployed on networks, which would make its use much more widespread, he added.

The success of multimedia depends, in large measure, on cost. Research with users has shown that, on average, they are not willing to pay more than an additional $5 to $10 for extended services. That is clearly inadequate to support the infrastructure, said Bill Glazier, manager of business development at Interactive Digital Solutions in Mountain View, Calif.

Partnering up

The networking infrastructure itself has taken center stage in multimedia discussions lately. Large companies, such as Oracle Corp., are forming partnerships with other large companies in the telecommunications and cable provider arenas to avoid being left out of the perceived gold rush.

"The big players are finally stepping up to the plate," said S. Ann Earon, group vice president of InfoTech Consulting, Inc. in Parsippany, N.J. "Previously, small companies, and not the big ones, [were] standing behind it."

Lucian Hughes, an associate researcher at Andersen Consulting in Chicago, said the technology itself is a big constraint to more widespread deployment of multimedia. Big multimedia systems are as difficult to set up as fiber-optic cabling to the home.

"We will see some good technology come to the fore and some fall by the wayside," said Bernadette Brugman, program manager of videoteleconferencing at GE Capital Corp. in Stamford, Conn. "We are at the beginning of a phase. The 80/20 rule will take effect," she said, in which 20% of the good applications will be the most effective.

IBM pitches LAN client complement to OS/2 Warp

By Ed Scannell

IBM announced last week it would begin beta-testing as early as next month its integrated LAN client-based version of OS/2, which will be aimed squarely at corporate users.

The new version is intended to be the higher-end complement to OS/2 Warp, which was formally announced last week. It will contain integrated requesters for IBM's LAN Server 4.0 and LAN Distance products and Novell, Inc.'s NetWare, as well as beefed-up TCP/IP applications and a variety of systems administration tools.

The LAN client version was designed to work hand-in-glove with the server version of OS/2, which will consist of OS/2 Warp and IBM's recently released LAN Server 4.0.



Together, the products represent a key part of IBM's overall enterprise strategy. The LAN client version is scheduled for a first-quarter release, and the server version is slated for early second quarter, company officials said last week.

But the prospect that many users outside IBM's "true Blue" base will completely buy into this strategy appears cloudy given Novell's formidable installed base and Microsoft Corp.'s typically aggressive marketing.

Conversion factors

"We really would like to convert over many of our NetWare servers to run LAN Server [4.0] because it makes managing things on OS/2 desktops a lot easier," said Ken Gabic, a senior systems programmer at Amerisure Insurance, Inc. in Southfield, Mich. "But converting over lots of servers can be pretty expensive and time-consuming."

John Handy, a technical consultant at a large chemical company in Gaithersburg, Md., added, "What they have in place with the LAN client and the server stuff is a pretty good combination, but I'd like to see some more conversion utilities for NetWare before we turn over lots of desktops and servers."

Another factor that could hold back IBM's OS/2-based client/server plans is user and developer uncertainty over which features will be included in the final versions of each, particularly the LAN client.

Some of this concern centers around whether IBM will bundle peer-to-peer networking in the LAN client version — an issue IBM officials have debated for more than a year.

"We aren't paying much attention to IBM's stuff right now because we are confused about what they will do with the peer-to-peer stuff," said one systems programmer at a large bank. "Right now Microsoft's [Windows for Workgroups] looks better to us for some of our small departments."

IBM is currently beta-testing a peer-to-peer product for inclusion in the LAN client or another version of OS/2, but the vendor believes it is better suited to small to medium-size companies, said Wally Casey, marketing director at IBM's Personal Software Products group.

"If you are a six-man, garage sort of operation, you are probably better off going with peer-to-peer instead of having a server-based solution," Casey said. He added that the upcoming LAN client version would feature a different BonusPak than the one bundled with OS/2 Warp, although the final decision on which applications will be included has not been made.

Like OS/2 Warp, the LAN client version will be available in two editions, one for users who have Windows 3.1 or Windows for Workgroups 3.11 installed and the other for users not using Windows.

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Executive shake-up continues at Lotus

By William Brandel and Lynda Radosevich

■ Less than two months after churning up its executive management team and one week before an expected dismal third-quarter earnings announcement, Lotus Development Corp. once again realigned its top management.

The company last week announced that Robert Schechter, a senior vice president, had resigned to "pursue other interests." One month ago, Schechter was reassigned from heading up international business to the newly created post of senior vice president of the worldwide services group.

Schechter's departure triggered a string of executive-level changes in Lotus' international operations and desktop business. Schechter will be replaced by June Rokoff, who took over Lotus' desktop applications business in the last executive shake-up.

With Rokoff's move, Lotus' desktop applications business will now have had three different leaders in the past two months. Ilene Lang, formerly vice president of international product development, will replace Rokoff.

The executive changes come amid reports that Lotus' product inventory in Europe is overstocked. A report released last week by Wall Street investment bank Dean Witter Reynolds charges, "the inventory problem is bigger than Lotus management would admit." The report states that it would take Lotus several quarters to clear out the backlog in its European channel inventory.



Robert Schechter, *senior vice president of the worldwide services group at Lotus, has resigned*

A Lotus spokesman said that because of Securities and Exchange Commission rules, he could not comment on the subject until Lotus releases its earnings later this week. However, a Lotus observer said the firm did not believe there was more than a 20-week buildup of excess inventory.

Trouble competing

The developments were not particularly good news for multinational companies that have standardized on Lotus products. Financial difficulty may indicate the company will have further trouble competing against Microsoft Corp.'s international technical and market strength.

Either way, after a handful of analysts lowered their earnings projections for the company two weeks ago, more are following suit. Alex. Brown & Sons has now lowered its estimate to 15 cents to 20 cents per share, while Dean Witter Reynolds lowered its estimate to 15 cents per share. Dean Witter's new projection indicates that Lotus' problems could stretch well beyond the end of the September quarter.



June Rokoff, *who will replace Schechter, comes from the ever-changing desktop applications business*

Other international operations-related management changes have followed Schechter's departure. Lotus' vice president and general manager of the European, Middle East and African divisions, Paul Bailey, has also left the company, to "pursue other interests." Bailey will be replaced by James Fleger, former director of Lotus' Latin American operations.

These management changes follow recent defections from Lotus' communications group. John Bartlett, former Notes product manager, left Lotus at the end of September to take a job as marketing manager for Oracle Corp.'s Documents. Before the Oracle/Lotus alliance announced last month, Oracle had pitched Documents as a Notes killer.

"I left for personal reasons and don't think this symbolizes a mass exodus from Lotus," Bartlett said.

Also, Larry Crume, former vice president of the CC:Mail division, resigned in late September. Sources at Lotus said Crume's departure was the result of a company reorganization that combined the Notes and CC:Mail groups and squeezed Crume out of power.

Notes/Sun bundling deal targets workgroup users

By Lynda Radosevich

Lotus Development Corp. last week announced a deal with Sun Microsystems Computer Corp. to bundle Notes for free with every SPARCserver system shipped worldwide next year. The deal gives new SPARCserver customers one Notes server license, one Notes client license and an application that guides the user through Notes on a SPARCserver.

"Sun is targeting the PC workgroup space with [its recently announced] Netra server line," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Bundling in Notes is one more step toward targeting that PC workgroup space."

The January ship date of the Notes/SPARCserver bundling — and a recent admission by Lotus Chief Executive Officer Jim Manzi that client/server pricing for Notes is being considered for 1995 — could be the first sign of new client pricing for Notes.

Now, Notes client and server software is not separated, and the per-node cost is $495. So users would have to shell out a lot more money to make use of Notes on SPARCservers.

Separately, Lotus announced major enhancements to its Notes imaging capabilities, aimed at making group communication software an appropriate platform for large-scale document management. Lotus said it will deliver next month a new Image Processing Server that integrates Lotus Notes:Document Imaging (LN:DI) Version 2.5 with production imaging systems from FileNet Corp., IBM, ViewStar Corp. and Wang Laboratories, Inc. LN:DI is add-on software that Lotus sells separately from Notes.

Putting a price on it

The new version of LN:DI, which helps users upsize their Notes imaging applications, costs $99 per client license. A server license costs $495. A separately sold image storage system costs $3,000, and an OCR server software costs $995.

Also, Lotus is delivering an improved LN:DI mass storage system and optical character recognition (OCR) server software. The OCR software is said to improve Notes' imaging performance and its ability to translate scanned images to usable text.

"The problem with the old [LN:DI] process was that it was a server task and detracted from overall Notes performance," said Neil Whitman, vice president and sales manager at Aide, Inc., a temporary help company in Greenville, S.C., that places design engineers in manufacturing firms. Aide uses LN:DI to manage some 15,000 scanned resumes. The new version speeds performance by separating the image access task from the Notes server and letting Aide run the OCR process in batch mode.

New SPARCservers. See page 57.

Messaging integration

Lotus revamps EMX switch

By Lynda Radosevich

Lotus Development Corp. last week added directory synchronization and other significant enhancements to its SoftSwitch EMX messaging switch. The upgrades were designed in part to entice users of its SoftSwitch Central to migrate to EMX.



EMX is a Unix-based network backbone switch that links electronic messaging systems. Lotus acquired EMX when it bought SoftSwitch, Inc. last summer. Central is a mainframe-based messaging switch that has shipped since 1984 and is used at a majority of Fortune 500 companies, analysts said.

Developing an alternative

SoftSwitch said it will continue to develop Central but is trying to make EMX an alternative for companies moving applications off the mainframe. EMX was beset by performance and reliability problems when it first shipped in 1992 and still represents less than half of SoftSwitch's installed base. However, analysts said the problems mainly have been addressed.

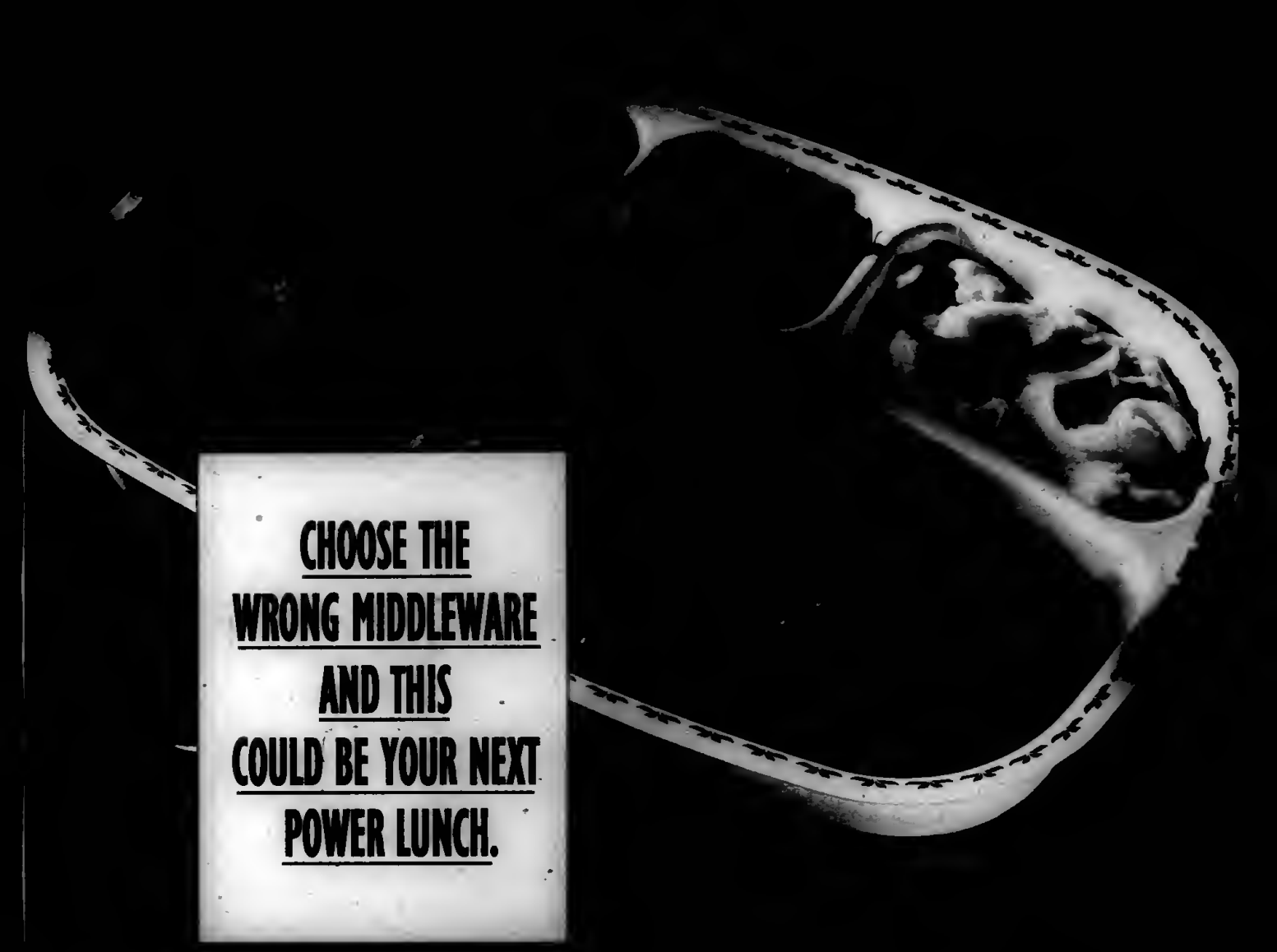
"One of the things my superiors are trying to do is get applications off the mainframe, and this is one of the things we'd look at," said Don Basta, a senior systems analyst at Commonwealth Edison Co., a SoftSwitch Central user and large electric utility based in Chicago.

EMX's directory synchronization is key because the utility supports mainframe, Unix and LAN-based electronic mail. Currently, synchronizing all these directories requires manual intervention, Basta added.

According to Lotus, the enhancements to EMX include the following:

- Synchronization capabilities to automatically keep a master directory of names and addresses up to date with directories of most of the major messaging systems, including IBM's Professional Office System (Profs) and OfficeVision, Digital Equipment Corp.'s All-In-1, Lotus' CC:Mail, Microsoft Corp.'s Mail and others.
- An IBM Profs access unit that allows direct connection between EMX and the IBM host-based mail system.
- An accounting facility that allows administrators to charge back to departments for switching services.
- Internet support that allows EMX to transfer multiple types of documents over the Internet.
- A rules manager that converts message address information from one type of system to another. It will work for all varieties of E-mail because the customer can configure it.

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Jim Bessen, "Riding the Marketing Information Wave" *Harvard Business Review* September-October 1993

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Management problems plague State Dept. IS

By Gary H. Anthes
WASHINGTON

The U.S. Department of State, which has been struggling with deficiencies in its financial systems for more than a decade, is not on a course likely to solve those problems. This is because efforts to correct the problems are hampered by inadequate planning and management.

That is the central conclusion of a recent report by the U.S. General Accounting Office (GAO), the audit and investigative arm of Congress. Other problems cited include the following:

- The lack of an agencywide information strategy, no single person to oversee financial systems and no documentation describing an anticipated new financial management structure.
- An inability to produce auditable financial statements of its $5 billion annual expenditures.
- Multiple, nonintegrated financial systems, with estimates ranging from 10 to 76 such systems.
- Five major systems plans, none of which addresses agencywide needs or attempts to tie together ongoing systems development efforts.

"The issue at State — and at many other federal agencies — really is a lack of top management setting the tone, saying that there really is going to be a positive commitment to change," said Ernst F. Stockel, assistant director at GAO's Accounting and Information Management Division.

Risky business

Last year, the State Department identified the following four high-risk areas related to its computer systems:

- Financial and accounting systems.
- Immigration visa fraud.
- Worldwide disbursing and cashiering.
- Information management (modernization, contingency planning and mainframe security).

"The State Department is about to spend another $50 million to hire yet another contractor to plan its Integrated Financial Management System," said Rep. John Conyers Jr. (D-Mich.), chairman of the House Government Operations Committee. "This is [its] third attempt in 12 years to link its worldwide operations and provide managers with reliable information, and we haven't gotten any closer to a working system."

System flaws

Integrated Financial Management System (IFMS) is intended to integrate and overcome the shortcomings of two major systems. One, for overseas posts, was started in 1982 and installed in 1992. The other, for domestic offices, was installed in 1991.

The latter system has proved unreliable, according to the State Department. And both systems are flawed because they are not tied together by an agencywide general ledger system called for in the original systems designs, the GAO said.

The State Department estimates that IFMS will cost up to $50 million and is seeking bids for the system. But the GAO said the agency should defer awarding a contract until it has developed a comprehensive plan for dealing with its systems and management shortcomings.

Jim Millette, a senior policy adviser to the State Department's chief financial officer, said the department generally agreed with the GAO's findings. "We are working to correct these problems, and we feel we are going down a good path to get there," he said.

Millette said the State Department was evaluating its options with respect to the IFMS procurement but declined to comment further.



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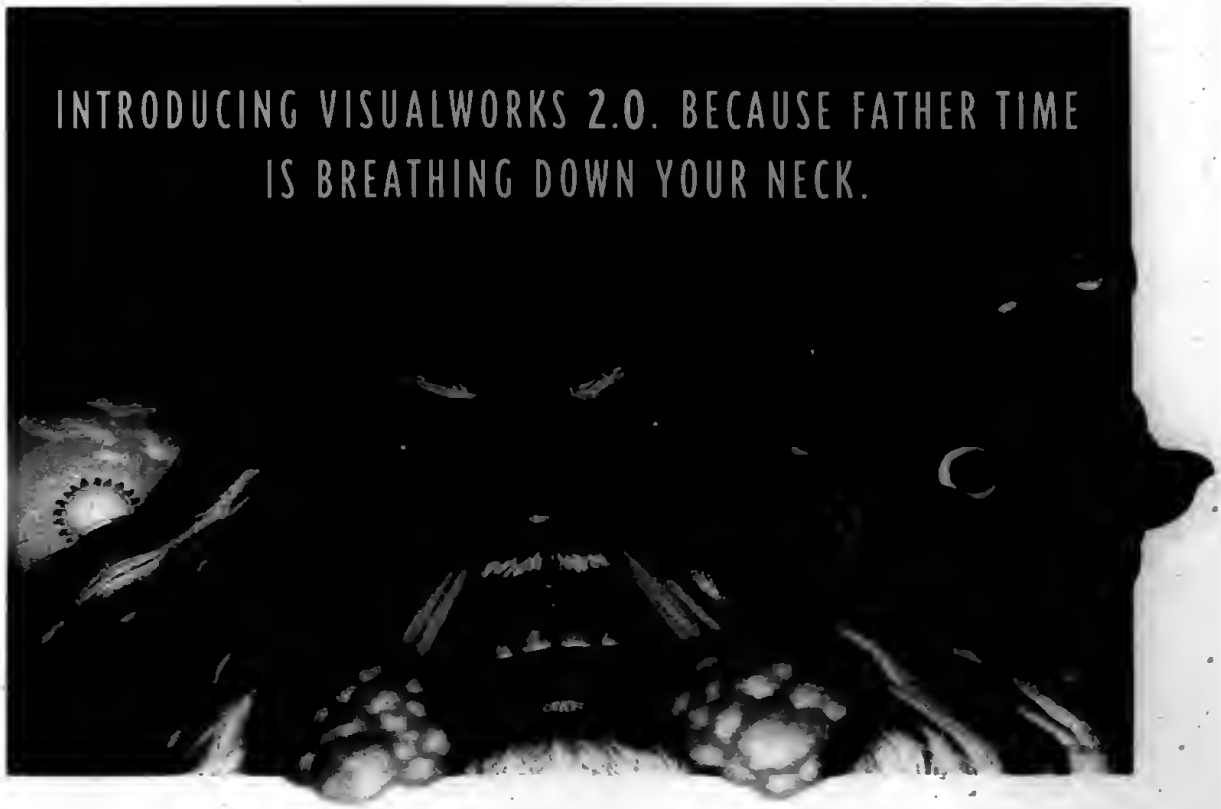
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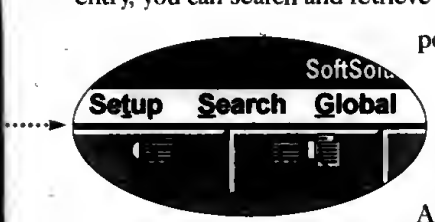








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Unisys' NT direction raises CTOS system users' concerns

Yet customers praise new mainframe upgrades

By Thomas Hoffman
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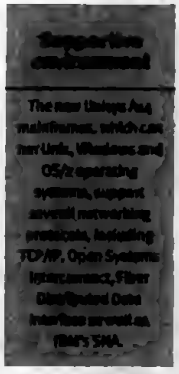
While most attendees at last week's Unisys Corp. Unite nser conference were upbeat about new A Series mainframe upgrades, users of its CTOS workstations voiced skepticism about the vendor's decision to base future development on Microsoft Corp.'s Windows NT.

Several CTOS customers said they fear that Unisys' decision to center future CTOS application development around Windows NT may stall other CTOS product enhancements. Furthermore, many users said they were not yet willing to gamble oo Microsoft's unproven operating environment for high-volume transaction processing activities.

"CTOS is proven and reliable. Windows NT may get there someday, but tt's not there yet," said Doug Dobson, an independent consultant from Winnipeg, Manitoba, and v ce chairman of the Unite SuperGen/CTOS working group. Dobson and other CTOS users complained that despite having more than 1 million CTOS workstation users worldwide, few Unisys sales representatives have even heard of the desktop platform. Yet the systems continue to generate more than $500 million in annual revenue and rank among the company's most profitable product lines.

Some users pleased

Unisys executives assured CTOS customers that the vendor will continue to invest in the desktop environment. Still, some CTOS users said the vendor's strategic direction with Windows NT makes sense.



"People want the Windows look and want to take it a step further with NT. Besides, NT will give us more choices as new applications are rolled out," said Carol Penczak, the SuperGen/CTOS chairwoman and a vice president at DP Solutions, Inc., an Elks Grove, Ill., consultancy.

By the end of the year, Unisys will introduce CTOS Desktop Plus, a software suite designed to tighten integration between CTOS and Windows. Also coming is CTOS Virtual PC Retease 2.0, an emnlation product that enables nsers to host Microsoft's MS-DOS and Windows systems on CTOS workstations.

New mainframes lauded

Meanwhile, most of the A Series customers in attendance expressed strong interest in the new single- and dual-processor A14 and A11 mainframes. "We're looking to upgrade from our dual A6s, so we'll probably decide between the A11s, A14s and even some A18 machines," said Gerry Hendrix, vice president of technical services at National Health Systems, Inc. in Englewood, Colo.

One of the most eye-catching features of the new A14 machines is the Electronic Service Request (ESR), which enables the mainframe to dial into a Unisys support center via a modem and alert the vendor of a potential systems problem. "I'd like to see Unisys offer ESR for its A19 machines," said Dave Crull, a technical support manager at Blue Cross/Blue Shield of North Dakota in Fargo.

The new A14 machines, which Unisys is positioning as high-availability mid-range mainframes, are available now and cost between $35,000 and $296,000. The four new A11 modeis, which run on high-capacity CMOS processors, range from $520,000 to $1.17 million and will begin shipping in mid-November.

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IS shops search for the multitalented

By Mark Halper and Suruchi Mohan

Genentech, Inc. envisions a day soon when it will be able to share moving images of molecular diagrams and other complex structures on-line with universities, research groups and customers.

But a major obstacle, according to Karl Kaste, manager of technology assessment for the San Francisco-based genetic engineering company, is finding talented individuals adept not only in emerging multimedia computing technologies, but in the video, sound and artistic techniques that form multimedia's backdrop.



Genentech's dilemma is one faced by many information systems shops and vendors. Like the client/server know-how that preceded them, multimedia skills are in short supply.

Capable individuals tend to be found in free-lance contractor circles and, to some extent, among hobbyists and computer games fanatics too young to have entered the job market.

Working 'round the clock

For example, Ty Ricker, president of the retail division of pewter arts vendor Michael Ricker Pewter, Inc., spent what he described as a year's worth of round-the-clock days and nights implementing a multimedia network of kiosk displays himself.

"You have to wear several hats — being the creative type, having marketing savvy and computer programming all rolled into one — and rarely do you find an individual who wears all three," Ricker said.

For Ricker, multimedia development was largely a do-it-yourself matter supported in part by integration services from his authoring tools supplier, Bohemia, N.Y.-based Advanced Media, Inc.

Gargantuan one-person efforts may become less necessary for IS shops, though, with the emergence of multimedia service firms such as Contemporary Creative Sources in San Jose, Calif., or InterApps, Inc. in Hermosa Beach, Calif.

One vendor that also hopes to help fill that void is Advanced Media, which plans to announce next month a joint venture with PC database developer Superbase, Inc., also based in Bohemia, N.Y. The new operation, which will be called Super Interactive, will provide multimedia development and implementation services, according to Advanced Media President Joel Sber.

Ricker said such services should be of interest to IS shops. "I did a tremendous amount of work I would not have had to do [if] this partnership been available," he noted.

For Kaste at Genentech, the most immediate way to find multimedia talent is to plumb trade shows such as the Telecon video and teleconferencing exposition held in Anaheim, Calif. last week.

But even companies specializing in providing multimedia goods and services are stymied in their pursuit of the right stuff.

For instance, executives at San Francisco Canyon Co., a video-enabling software provider, and at Monterey, Calif.-based Thinking Tools, Inc., a simulation software firm, said they too have to search widely to find the proper mixture of talents.

For Ottawa-based outsourcer and systems integrator SHL Systemhouse, Inc., finding multimedia developers to create training programs for the company's Transform reengineering software was a huge challenge (CW, Sept. 19).

"They had all gone to work for Sega and Nintendo," recalled Rick Beatty, SHL Systemhouse's executive vice president of technology, referring to the computer games companies.

As a result, SHL Systemhouse was forced to turn to contractors such as the National Education Corp. in Irvine, Calif., and Digital Video Service in Ottawa.

An alternate route

In a move that further shook up the integrator's wing-tipped corporate culture, SHL Systemhouse also hired a number of artists to create animation for Transform. Managing the new mix of worker types became a task of its own, he added.

"Start talking to an artist about encapsulation and polymorphism, and they go blind on you," he said.

And the battle isn't over once a company lands multimedia talent.

"There is a delicate balance between those young enough to know the technology and old enough to know the business. To have some seasoning is at least some desire of ours," said Bob Bodine, director of audiovisual and videoconferencing at Kaiser Permanente in Oakland, Calif.

Outside the realm

Lights, Camera, Action! In an illustration that multimedia is drawing on talents and wherewithal outside the typical IS shop, Advanced Media and Superbase's joint multimedia services company will use a Los Angeles post production video studio. Advanced Media purchased the property to increase its chances of landing talented developers.

Help desks

CONTINUED FROM PAGE 1

What distinguishes the newer systems from previous customer information systems, analysts said, is the single integrated customer snapshots they furnish. Many companies would already have much of the information these pictures convey, but it is scattered and often incomprehensible.

Take, for example, the service technician called to your home to fix that side-by-side freezer. Had he accessed your customer profile, he may have seen that earlier in the day you called a second time, about a dishwasher on the fritz.

With the updated request in hand, he could have noted the make and model number of your dishwasher and whether it was still under warranty. Then he could load his truck with replacement parts for both appliances. If he did not know how to fix the dishwasher, he could access the proper documentation from the system's integrated help desk module. As a customer, you would hopefully be delighted with such one-stop service.

Internally, companies are mining reports generated by this data — all of which is housed in a single relational database — for everything from designing new products to pinpointing new markets.

The bottom line, users said, is that help desks are now evolving beyond their traditional role of fielding questions and furnishing answers about hardware and software. Thanks to the more sophisticated software, they are becoming strategic information clearinghouses for the entire enterprise.

Looking for better access

"What's in place today are homegrown stovepipe systems that are very narrowly focused," said Heidi Dix, a software analyst at Forrester Research, Inc. in Boston. Examples include systems that house sales and service records in different databases.

"What's driving a lot of the new technology purchases is an attempt to have better access to information that is very likely [to be] useful to people across the entire organization," she added. Early users are primarily companies with large service businesses such as makers of computers and other equipment.

Companies selling these newer integrated systems include Astea International, Inc. in Chalfont, Pa., Aurom Software, Inc. in Santa Clara, Calif., and The Vantive Corp. in Mountain View, Calif.

All three vendors grew up selling software for help desks. From there, they branched out into other customer-related functions, bringing out sophisticated reporting features and additional modules for automating functions such as sales management and field service. Two weeks ago, for example, Astea announced a sales automation management module, the third product in its customer interaction software suite.

Telephone switch manufacturer Siemens Rolm Communications Co. in Santa Clara, Calif., initially bought Astea's system to track sales orders. Today it uses the RS/6000-based client/server system for billing, dispatching remote service technicians, job costing and tracking maintenance contracts. Information about all of these activities is available enterprisewide.



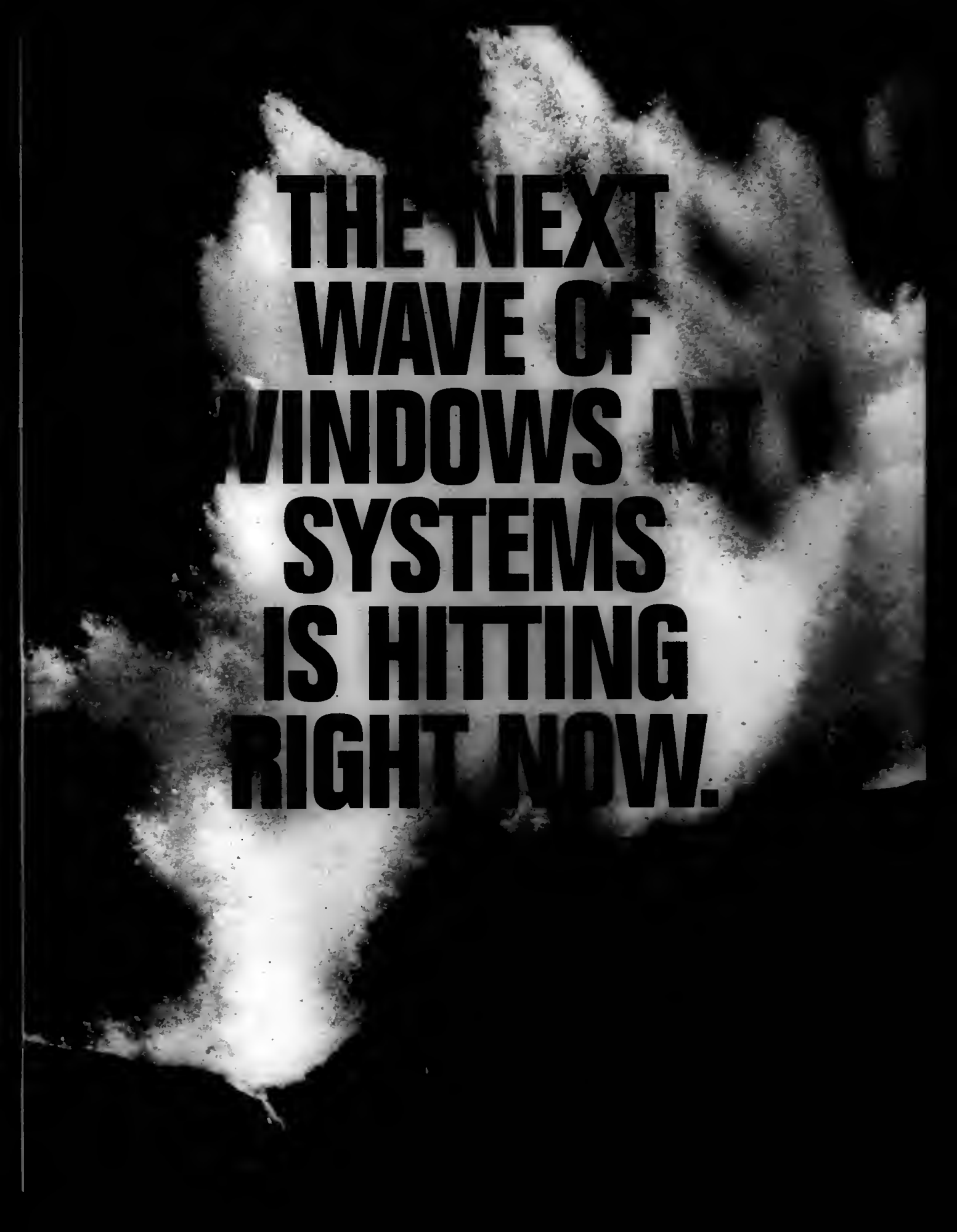
"By looking at orders for moves, adds and changes, sales can see when a switch is approaching capacity and approach the customer about upgrading," noted Kurt Keiser, vice president of information systems and telecommunications.

On the IS side, "we've also had a lot of savings having to deal with only one system and one platform," Keiser added.

Another user, Storage Dimensions, Inc., a disk drive and tape manufacturer in Santa Clara, Calif., initially installed Answer System, Inc.'s Apriori system as help desk software. Two years later, it has evolved into a critical marketing tool, generating at least 10% of new sales leads, according to Bill Kirkwood, director of customer support and service.

Information gleaned from customers who tap into the system helps guide product development. The company added a so-called hot-pluggable feature to its controller boards and power supplies as a direct result of the positive customer response to the same feature on its disk drives. Customer feedback was culled from calls to the company's technical support center.

"We scrutinize data [from the system] for the first 100 days [after a new release], looking for trends," Kirkwood said. "This information is then shared and reported to senior management, engineering, product marketing, sales and quality."


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Briefs

Chipcom results fall

Chipcom Corp. posted a 35% drop in profits, or $2.2 million, for its third quarter ended Sept. 24, compared with $3.4 million recorded for the same period last year. The drop was attributed to a $7.9 million charge for the purchase of David System, Inc. The firm reported revenue of $71.7 million, up from $42.4 million earned in the third quarter of 1993.

Seagate takes a hit

Seagate Technology, Inc. said profits for its last quarter ended Sept. 30, were down to $22.5 million from $36.1 million last year. It said the drop was due to a $43 million charge related to the acquisition of Palindrome Corp. The firm also reported $993 million in revenue, up from $773.5 million for the same period last year.

Wellfleet gleams

Wellfleet Communications, Inc. reported profits rose 85%, or $21.6 million, for its first quarter ended Sept. 30, compared with $11.6 million for the same quarter last year. It posted revenue of $126.6 million for its past quarter ended Sept. 30, up 75% from revenue of $72.4 million for the same period last year.

DSC perks up

Digital Sound Corp. reported revenue of $8 million for the third quarter ended Sept. 30, up from $4 million for the same period last year. Compared with a loss of $1.7 million for the same period last year, the Santa Barbara, Calif., firm posted a $642,000 profit for the quarter. Separately, AudioFax is suing the company for allegedly breaking a 1991 agreement that licensed AudioFax technology to Digital Sound for product development.

SHORT TAKES Philips Communications and Processing Services, Inc. in Houston has acquired data processing provider Power Computing Co. in Dallas.

Channel closes doors on product warehousing

By Jaikumar Vijayan

■ As PC vendors attempt to flood the market with inventory for the year's busiest selling season just ahead, a jittery distribution channel is warning that it will not carry surplus inventory — or get stuck with it again.

With memories of last year's still-unsold stockpile of thousands of IBM PC Co. ValuePoint PCs still fresh in the channel's collective memory, the message this time around is clear: No more warehousing of vendor products.



It won't happen here

"We are not going to be the dumping ground for manufacturers this year," said Tony Ibarguen, executive vice president of sales and marketing at Entex Information Services. "It's a question of economics. We don't want our balance sheets to be affected by unsold inventory."

Ibarguen said no major vendor has yet reached the position where its product supply outstrips its demand. But he said he expects this will happen soon, as vendors ramp up for the holiday shopping season.

More research

This time around, vendors will have to forecast demand better — or get used to the idea of getting stuck with their inventory, Ibarguen suggested.

According to analysts, last year at least some of the major vendors — led by IBM — overestimated fourth-quarter demand and stuffed the channel with more systems than they could sell. Consequently, several major resellers had to take substantive losses, which they hope to avoid this year by refusing to stockpile systems.

This may cause some vendors to reevaluate their strategies, said one channel source at a large reseller. For instance, IBM, after overestimating last year, is reportedly moving slowly with Aptiva, its recently launched consumer PC, despite increasing demand.

Supply and demand

Anxiety this year has also been spurred by a reported pileup of low-end 486SX-based desktops from companies such as Compaq Computer Corp. and IBM. The pileup, however, has been restricted to the low end for the most part, analysts and resellers said.

"So far, demand is greater than supply," especially as far as notebooks and popular multimedia systems are concerned, said David Goldstein, president of market research firm Channel Marketing Corp. in Dallas. With what he expects to be a "record fourth quarter," he said he does not anticipate major stockpile issues.

Cash rewards

With the peak selling season ahead, desktop leader Compaq recently began an incentive program with at least one major reseller. The company will offer cash awards of $250 to sales representatives for each ProLiant server they sell until Jan. 15. The reseller will offer an additional $50 as incentive for each unit sale, prompting some rivals to ask whether the incentives were being offered because of lack of interest in the product line.

HP seeks boost in storage market

By Mary Brandel

Hewlett-Packard Co. wants to do for network storage what it did for laser printers — that is, dominate the reseller market.

To that end, HP's storage division took the following steps last week:

- Changed its name from the Mass Storage Group to the Information Storage Group. It now includes tape, disk arrays, hard drives and optical products.
- Grouped its disparate storage products under a single SureStore nomenclature. This, HP said, will ensure consistency, compatibility, centralized support and common terms and conditions for all its products.
- Created a set of criteria that software must meet to sell with SureStore hardware. The criteria include simple network integration, plug-and-play capability, multivendor support and a minimum one-year warranty.
- Introduced its first SureStore products, including two 3½-in. disks, a tape autoloader and an optical jukebox. All are geared to users who have no time to mess around with storage.

Analysts said the moves would give HP a boost in the highly competitive, price-sensitive market.

"One way to increase your revenue as prices fall is to increase the percentage of sales outside your own market," said Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif.

Meanwhile, competitors IBM, Seagate Technology, Inc. and Quantum Corp. are turning up the heat. "My only concern is how HP can compete on price with some of the aggressive players out there," said Michael Casey, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif. "It remains to be seen how that particular part plays out."

HP said it will sell $1.5 billion in storage in 1994. About 60% of that will be to resellers. Roughly 40% goes to OEMs, the biggest OEM being HP itself. By comparison, Seagate claims to sell 30% of its drives through resellers.

Products announced include the following:

- A six-cartridge, 5G-byte tape autoloader, dubbed the 1200E, for backing up Novell, Inc. NetWare- and Microsoft Corp. Windows NT-based LANs. It can be bundled with Palindrome Corp.'s Backup Director for the Workgroup. List price is $3,650, or $4,650 with software.
- Two 3½-in. disk drives — the 1G-byte 1000S and 2.1G-byte 2000S — with five-year warranties and easy-to-use installation utilities. Both are expected to be available Nov. 1.
- A $12,995, 20G-byte Unix optical jukebox that connects at any place on the network rather than through a server. A 340M-byte magnetic hard disk, direct-LAN attachment hardware and jukebox management software are included.

This is the second time this year HP has reorganized in its storage division. In May, it combined its disk array and optical groups into the Systems Storage Division, whose charter was network storage management. The group promised software products that address storage management in this calendar year.

Wound up in tape

Last year HP was the top revenue producer of OEM tape, with 21.4% of the market. But it was not a force in the disk drive market.

1993 disk drive* shipments

MARKET POSITION	VENDOR	PERCENT OF MARKET
1	Quantum Corp.	20.7%
2	Seagate Technology, Inc.	19.6%
3	Conner Peripherals, Inc.	18.6%
10	HP	1.4%

*OEM market 1-, 2½-, 3½- and 5¼-in. disks

Source: International Data Corp., Framingham, Mass.

Supply side

HP is the third-largest supplier of 5¼-in. optical rewritable drives in terms of unit shipments, according to Dataquest. Sony Corp. is at 27.6%, Panasonic is at 16.2%, and HP is at 14%.

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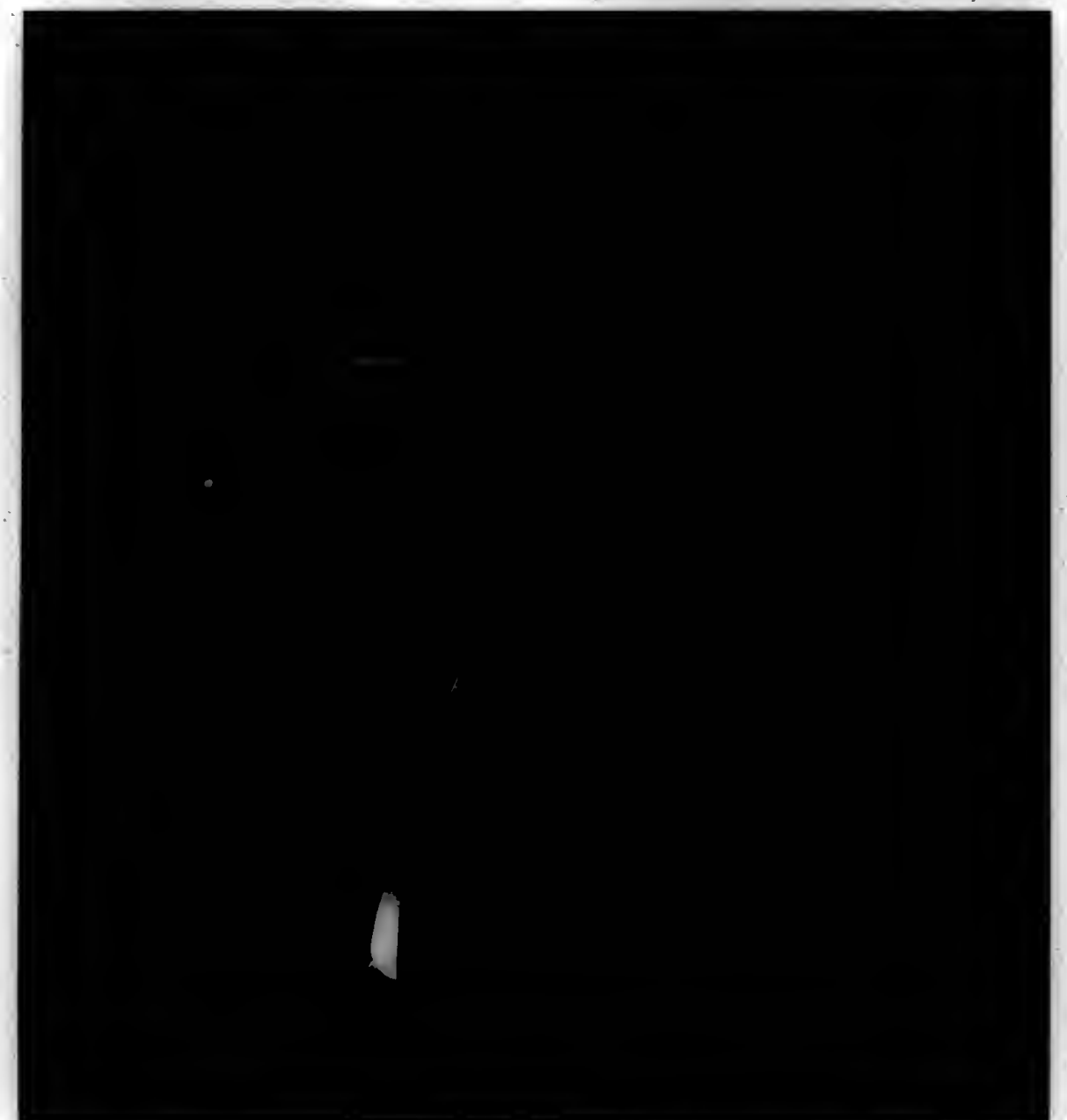
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00 PER COMPUTER.
E AVERAGE COMPANY?)

Whether they acknowledge it or not, most companies spend more than *13 times* the purchase price of a PC over its 5-year lifetime.*

At Dell, we're not making wild claims about halving that cost of ownership. But we're doing a lot more to lower it than most other PC vendors today.

Read on to find out how we can cut your costs and hassles over all 3 stages of a PC's life-cycle: to the desk, on the desk and off the desk.

HOW DELL SAVES YOU MONEY GETTING YOUR PC TO THE DESK.

To begin with, you pay less. Our Pentium™ processor-based OptiPlex™ 560/L system starts at just $1999*;



about what you'd have to pay for a mid-range 486 system today.

And good luck trying to find a PC vendor who can save you time and money in managing large-volume projects like Dell can.

To give you an idea, in 10 days we can custom-build 1000 different configurations for you and install them at 100 different locations all over the country.

In the process, we can even load your proprietary software and install customized peripherals like special keys and brackets.

HOW DELL SAVES YOU MONEY WHILE YOUR PC IS ON THE DESK.

Most of the costs associated with owning a PC occur *after* you put it on a user's desk. But what can you do to cut those costs?

For starters, you could buy PCs today that you'll actually be able to use a couple of years from now.

Our Pentium processor-based OptiPlex systems, for example, are equipped for future technologies like Chicago with features like Plug & Play, PCI and Enhanced IDE.

And speaking of the future, our 3-year Limited Warranty† covers a few things that other warranties conveniently overlook. Like your monitor, NICs and peripherals.

We also include nationwide on-site service for a full year.* (Not that you're going to need it a whole lot, since all Dell® systems are built to ISO 9002 quality standards.)

HOW DELL SAVES YOU MONEY GETTING YOUR PC OFF THE DESK.

Old PCs can cost a fortune. As much as $600 each to dispose of, says the Gartner Group.* You can save some of that cost with Dell's trade-in credit on many old PCs.

What you really save, however, are most of the disposal hassles. We'll remove your asset tags, clean off your hard drives and haul away your old PCs. And with our EPA-compliant disposal process‡ those dead PCs won't come back to haunt you in the form of a costly fine.



But we could go on and on and there'd still be skeptics among you.

So tell you what. Call to speak with a Dell representative or to schedule a meeting with an account executive in your area.

In either case, we'll *show* you how much Dell can save you.

It's an offer no other computer company has the guts to make.

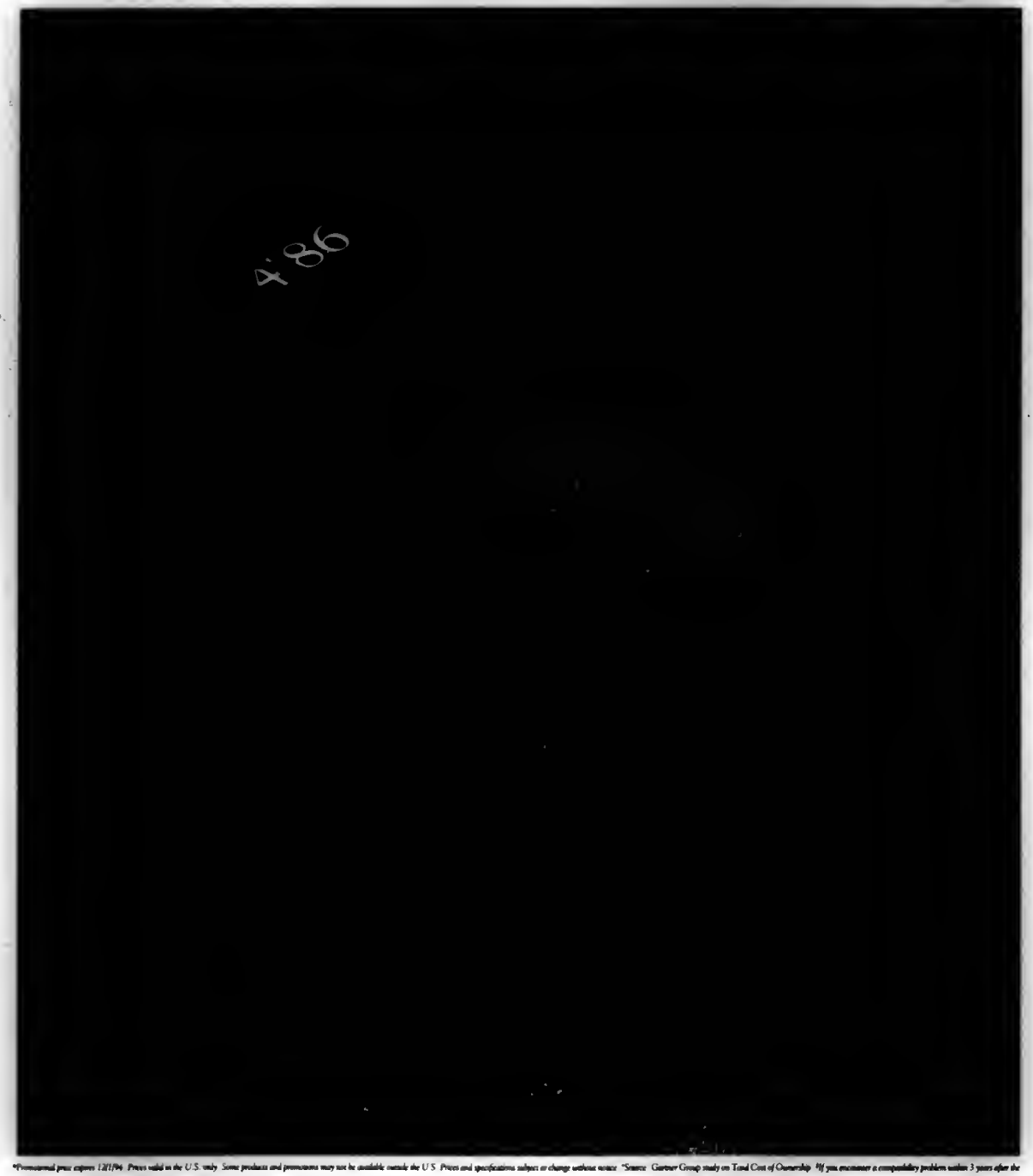
But then, we're not your average computer company.

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WE DROPPED THE PRICE SYSTEM SO HARD,



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OF OUR PENTIUM CHIP WE KILLED THE 486.

The new Dell® OptiPlex™ 560/L Pentium™ chip system is now just $1999.

Which means it's as affordable as a mid-range 486.

Which means there's no reason you can't start investing in Pentium chip-based systems immediately.

Which means you'll then be prepared for all the "must have" technology that's coming down the pike, like Chicago and PCI.

Which means you'll be saving yourself a truckload of headaches down the road.

This system is ready for just about anything. It's Plug & Play. And it's powerful; it even has a 256KB cache.

Dell can custom-build your Pentium chip systems for you and install customized peripherals. And, if you want, we'll even load in your proprietary software.

Bottom line, we'll save you a ton of money getting your system to the desk. Now we'll show you how we save you money while it's on the desk, and when you want to get it off the desk.



DELL OPTIPLEX 560/L 60MHz PENTIUM PROCESSOR-BASED SYSTEM

$1999*

- Business Lease◊: $74/Month
- 8MB RAM, 210MB Hard Drive
- 3.5" 1.44MB Diskette Drive
- 256KB External Cache
- VS14 Monitor (14" CRT, .28mm)
- Local Bus Video
- Enhanced IDE
- Plug & Play
- 3-year Limited Warranty†

Order Code #300247

HOW THE DELL OPTIPLEX 560/L SAVES YOU MONEY ON THE DESK.

According to a Gartner Group study,‡ most of the costs of owning a PC occur after it lands on a user's desk. Dell has figured out some ways to cut those costs.

We back all of our PCs with a limited compatibility guarantee‡, so you can take advantage of future technologies. And we'll help you custom-tailor your service plan so you'll get what you need without paying for services you don't.

We also cut a lot of the not-so-obvious, yet very real costs. Our 3-year Limited Warranty, for example, covers your peripherals,



factory-installed NICs and even monitors. (Not that you'll need service much, since all Dell systems are built to ISO 9002 standards.)

HOW THE DELL OPTIPLEX 560/L SAVES YOU MONEY GETTING YOUR OLD PCs OFF THE DESK.

Getting rid of your tired old computers is one of those time-consuming, expensive jobs most of you can do without.

So we'll do it for you. Even better, call now and we'll give you a credit of up to $100 for every 386 system you trade in for a new Dell OptiPlex 560/L Pentium chip PC.**

So call, and let us show you how much Dell can save you.

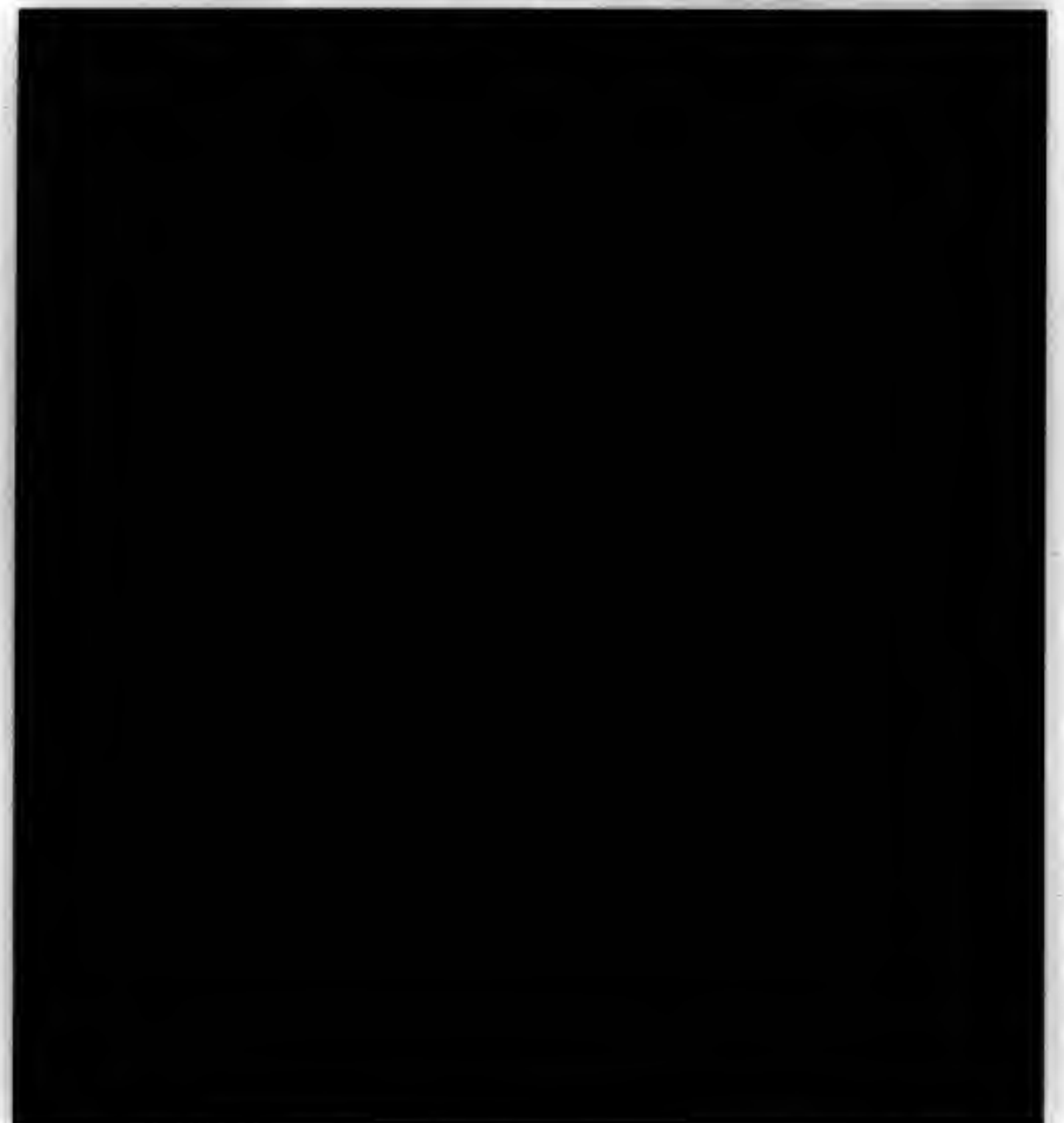
It's enough to kill a 486.

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TALL 1000 CUSTOMIZED COUNTRY FOR YOU. ALSO DO IT YOURSELF.

Managing a large-volume project takes a miracle.

A miracle you may soon have to perform if you choose to upgrade your standards for Chicago.

Or if a new automation initiative means you have to magically equip your company's entire sales force with portables overnight.

You'll then have two options, not counting celestial intervention:

You can hire partners in Dallas, San Francisco, New York and who knows where else, then manage the whole shebang yourself. Because no middleman can do it all for you.

Or you can call Dell, then sit



back and relax. Because we'll do everything it takes to pull off even your biggest projects.

It's just one of the areas in which we've lowered the costs and hassles associated with all three stages of a computer's life-cycle: to the desk, on the desk and off the desk.

WE CAN CUSTOM-BUILD AND INSTALL 1000 CONFIGURATIONS AT 100 LOCATIONS IN 10 DAYS.

No smoke and mirrors, really. We start by creating a pilot program where we assess every configuration and location in meticulous detail. (To make sure your roll-out goes smoothly, even before it happens.)

Then we custom-build each PC to your specifications. No matter how many configurations you need.

HOW DELL LOWERS YOUR COSTS AND HASSLES WHILE PREPPING YOUR SYSTEMS.

We can pre-load your software, even proprietary software written specially for your company.

We can load your peripherals, even customized ones like special keys and brackets.

Another trick: we can tag your PCs with your own asset tags.

By the way, all of our PCs are built to ISO 9002 quality standards, then covered by Dell's exclusive compatibility guarantee.*

HOW DELL LOWERS YOUR COSTS AND HASSLES WHILE INSTALLING YOUR SYSTEMS.

Unlike most big PC vendors, Dell will build, store and ship all your systems from one location: our facilities in Austin, Texas.

So you won't end up wasting time or paying storage and management fees to a middleman.

As each new PC arrives at its location, a Dell representative can be right there to install it.

Before disconnecting your old PC, we can transfer its files. So you won't be expected to conjure up a lost file for an irate user later.

You won't be expected to get rid of the old PC either. We can do everything from cleaning off its hard drive and removing its asset tag to physically hauling it away.

And with our EPA-compliant computer disposal process, that dead PC won't come back to haunt you in the form of a costly fine.

BUT DON'T TAKE OUR WORD FOR IT, TAKE IT IN WRITING.

Give us a call and we'll send you a project bid to prove how much Dell can do for your company.

And the next time you need to pull off an impossible project, remember one thing:

We'll perform the magic. But you'll get the applause.

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Money matters

Intel is getting a little frustrated. Despite heroic marketing and sales efforts, its thoroughbred Pentium is having trouble leaving the starting gate.

Meanwhile, PC makers such as Compaq are hitting the trifecta with sales of systems loaded with yesterday's microprocessor technology, the 486. To Intel's dismay, early users of Pentium-based systems are reporting some unanticipated training costs. With the real cost of training in the $100-per-hour range, corporate users have reason to balk.

Now on the desktop horizon there looms the holy war of IBM and Microsoft, who are ushering in souped-up versions of OS/2 and Windows, respectively. Upgrading to those systems will cost a pittance for the software itself. But what happens after that?

The growing reticence on the part of users to jump to the latest and greatest gizmo, be it hardware or software, is more fully explained in research that the Gartner Group is gathering on client/server migrations. The findings are compelling, if not stunning. Check this out: The five-year cost per client in a client/server migration at a large firm with a distributed environment is — drumroll, please — $66,350. Multiply that by a few hundred users, then figure out a way to cost-justify it to the boss.



But the more interesting finding is this: Of the total migration costs, more than $7 of every $10 goes to labor for things such as end-user support and application development. Just think about that for a moment.

So how are such expenses being justified? Ever heard of voodoo economics? Well, consider another Gartner finding. One-third of client/server costs will be rung up outside the traditional IS budget, most of them hidden and disguised or just plain buried in user-department budgets.

Never has there been a better reason for recentralizing key aspects of client/server migration because the expense figures we're talking about in such migrations are just awesome.

Still, there seems to be a trend toward greater amounts of information technology spending falling outside the central IS realm and therefore out of control, out of sight and, to some extent, out of mind.

There is no question in my mind that a reversal of this trend will take place in the next 12 to 24 months. And the Windows 95s and Warps of the world — the new versions of Windows and OS/2 — will hasten this trend when customers have to reconcile the true and complete costs of migrating to a new operating system. Pentium merely ignited this reverse thinking.

As this recentralization inevitably takes shape, the greater challenge will be to not mistake this as an opportunity to regain total control or to remake the glass-house thinking of 10 years ago. The opportunity will be to move ahead, prudently and intelligently.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*



The big picture

Leilani Allen has some valid points, but I would draw the line before calling them great "Truths" ["The ghost of IS future," CW, Aug. 22]. Perhaps in a small outfit such as PNC Mortgage the velocity of change she describes is practical, but it doesn't work that way in an enterprise of a global nature.

Mortgage banking is not an industry that is exactly on the leading edge of anything. Before I would accept Ms. Allen's thesis of change, I would like to see it applied successfully at a General Motors, Toyota, Merck or Schering-Plough.

I would submit that much of her "vision" for an enterprise of appreciable size would turn out to be a nightmare. Her Rube Goldberg concept of information technology leaves a lot to be desired.

Geoff Wascher
CDI Computer Services
Troy, Mich.

Who will pay?

How can you argue against universal access to the Infobahn ["Stay out of the way," CW, Sept. 26]? Also, given the overwhelming importance of real roads and highways, universal transport needs to be similarly mandated.

The U.S. government must pass a law mandating a terminal in every home, a chicken in every pot and a car in every garage. Who will pay for all this largesse? It's obvious: We'll tax the Japanese. That should reduce the trade imbalance somewhat. And by the time they run out of money, the Chinese should be doing nicely enough to pay us back for the favor of "Most Favored Nation" status....

Allan Lees
Sybase, Inc.
Emeryville, Calif.

No 'Power' outage

My firm has not had the problems with PowerBuilder implied in your recent article ["Powersoft catches user flak," CW, Aug. 22].

No leading-edge client/server development environment is flawless. We have not had any problems with PowerBuilder that have prevented us from delivering stable applications to our customers.

Powersoft has been shipping thousands of copies each month. Many of these copies are being used by individuals with as little as one day of professional training on the tool's proper usage. They then embark on designing and developing complex client/server applications. Imagine sending someone to a couple of days of C training and then requiring that they attempt to rewrite a version of Windows. After all, it's just another C program.

The solution is not to practice what we preach, but to practice before we preach.

Harold R. Ross
PowerCerv Corp.
Tampa, Fla.

Score one for ATP

You can imagine my amazement when in reading *Computerworld* I find that the U.S. Open is now electronically scoring its matches ["U.S. Open makes tennis tech history," CW, Sept. 5] ... something the ATP Tour developed three years ago and has since used in 67 ATP Tour-sanctioned tournaments in 39 countries.

With the IBM/ATP Tour Matchfacts system, the chair umpire scores the match using a palmtop computer and downloads to an IBM ThinkPad. The Matchfacts are produced locally and also transmitted to our AS/400 in Ponte Vedra Beach, Fla., for processing. At the end of each week, the AS/400 processes these tournament details and produces the IBM/ATP Tour World Rankings of all professional players and updates the centralized Matchfacts and Press information systems.

The rankings are used by all tournaments, including the U.S. Open and the other three Grand Slams to seed players.

ATP Tour chair umpires, some of whom appear at the U.S. Open, have not used paper and pencil to score matches in three years, except at the U.S. Open.

Peter W. Gentry
ATP Tour
Ponte Vedra Beach, Fla.

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   70 Mining/Construction/Petroleum/Refining/Agric
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   70. Medical, Legal, Accounting Management
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   60. Information Centers/Libraries, Educators, Journalists, Students
   90. Other Titled Personnel

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   Operating Systems
   (a) Solaris (e) Mac OS
   (b) Netware (f) Windows NT
   (c) OS/2 (g) Windows
   (d) Unix (h) NeXTstep

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   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31 Programming Management, Software Developers
   41 Engineering, Scientific, R&D, Tech. Management
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   CORPORATE MANAGEMENT
   11 President, Owner/Partner, General Manager
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   (c) OS/2 (g) Windows
   (d) Unix (h) NeXTstep

   App. Development Products ❑ Yes ❑ No
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Who will be in charge?

Neal M. Goldsmith

At issue in the information superhighway are power and wealth. This is because control of information is power and access to information is wealth.

Who will have access to the network, and who will control its format and content? Will regulators require the superhighway to be accessed by a full, representative range of information providers and programmers? Will access and programming be determined by the invisible hand of the marketplace? Put differently, in our 21st century commercial technocracy, will there be programming of interest to the lowliest and the most eccentric among us? Will the electronic couch potato care?

Access to the emerging virtual playing field will become a necessity in Infotopia. Will society protect a right to network? What of the fundamental bake-off between telephone and cable? Until recently, cable's plan for 500 channels had the lock because standard RS-232 telephone wire into the home has too little bandwidth to carry the amount of information required by interactive multimedia, and nationwide optical was years off. Now, why not 10 million channels?

Bell Labs has announced a new form of compression that will enable not only an interactive network but also a simultaneous telephone conversation on the same line. Even with fiber-optic cable, all 500 channels have to go to every subscriber's site. With the regional Bell operating companies offering multiple, individual, site-to-site switching, every home can have access to its specific request, no matter how seemingly towly or eccentric, at the same time as every other eccentric home has its own specific requests fulfilled.



All new capabilities carry the possibility of abuse and an obligation for responsible use.

Cable's building spree of the 1980s left it saddled with debt and utterly unable to finance the $50 billion cost to rewire the country with fiber optics. However, cash- and credit-rich phone companies — recently freed to carry any programming — are now in an excellent position to become the purveyor of the network to the home and office.

The tidy ending will really have to wait, however, for the last issue of access to be decided — privacy. The government seems to have blinked on its "Chipper Clip" proposal, for now, but how easy will it be for a government agency to get a court order to read a company's electronic mail? What degree of access will others have to information about you and your financial history? How susceptible to viruses, hacking or sabotage will the network be?

We have a virtual "target market segment of one" over the superhighway. The ultimate in democracy — one person, one dollar, one vote — I get to choose from 10 million channels. Every time you use an interactive service or buy a product on-line, the transaction will be collected and analyzed. The question we must ask about access to consumer information is not "If?" or "When?" but "How far?"

As with all powerful new technologies, every new capability carries the reciprocal possibility of abuse and the corresponding obligation for responsible use. Let's not blow this one.

Goldsmith is president of Tribeca Research, Inc., a New York-based technology change-management consulting firm.

IS departments still must measure up

Max D. Hopper

At a recent meeting of my peers, I discovered that the corporate leaders of a number of large companies no longer require their information systems departments to assess the economic impact of projects or measure their on-time/on-budget performance. This signals a change that should be cause for some applause and no little degree of wariness among IS managers.

In contrast to project expenditures in other departments, such as operations, marketing and finance, the investment wisdom of IS implementations has long been the object of corporate scrutiny. In the early years of our discipline, when information technology was exotic, systems were expensive and applications were largely unproven, this was wholly understandable.

Return-on-investment analysis and monitoring a major project is simply solid management.



However, technology has evolved, IS practices have matured and so has the acceptance of their value. IS projects are increasingly characterized by lower-cost capabilities, more predictable outcomes and less controversial benefits. In some cases, IS is approaching the same level of acceptance as that of a utility — an implicit cost of doing business. Why then should IS managers have to rigorously prove the value of their tools any more than facilities managers need to justify power bills?

Viewed from this perspective, the news that some companies have abandoned the measurement requirements unique to IS projects seems appropriate. It suggests that these IS professionals have concluded their apprenticeship and taken their place among the more mature disciplines as a full partner in the business. Those who have been accorded this new stature can be justifiably proud. But this does not mean they can ignore accepted measurement criteria required for effective management.

Any project involving significant corporate expenditures should be preceded by a return-on-investment analysis that seeks to predict the cost/value trade-offs. Once initiated, performance of all projects should be monitored for adherence to established budgets and implementation schedules. This is solid management discipline.

IS managers can argue that precise measurements have always been difficult to achieve in their domain. Return on investment is often hard to quantify when the IS component of projects involving re-engineered business processes is just one of a number of factors that contribute to the project's performance yield.

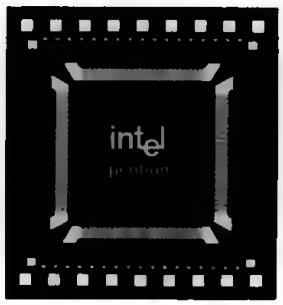
Moreover, original budgeting and scheduling estimates are frequently foiled by a scope of work that expands during development into something much more ambitious than originally conceived. New information technology capabilities emerge during the project's gestation that tempt us to do more. These create a moving target in terms of our objectives.

Yet for all the shortcomings of our measurement practices, the rationale for pursuing them has not really changed, even if the corporate mandate to do so is being relaxed.

Just as there would still be a valid role for accounting, even if there were no Internal Revenue Service, there is still merit in refining our techniques for measuring IS performance. These practices still afford some validation of management decisions and an index for assessing project management skills. They also provide a self-correcting mechanism that moves our discipline away from an art form toward the accuracy and predictability of a science. If we assume responsibility for candidly measuring our own performance, we need never fear the assessment of others.

Hopper is chairman of AMR Corp.'s The Sabre Group.

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Kimball Brown

Wireless wait



What a difference a year makes.

At the end of last mooth, Sony introduced its Magic Link device, the first commercially available product running the long-awaited General Magic software. At the same time, AT&T made available its PersonaLink Services on-line service.

The introductions were held at the lavish Sony Music headquarters in New York but were understated and very straightforward — the polar opposite of the near-hysteria we saw at the 1993 Macworld trade show in Boston when Apple unveiled its Newtoo MessagePad.

With Magic Link, Sony and the alliance of General Magic and AT&T have created a system that makes E-mail a breeze for the uninitiated and provides a platform for a series of new applicatioos that in the next few years should go well beyond today's offerings. While the device is a good first implementation of the Magic CAP platform, the key is the behind-the-scenes infrastructure created by the General Magic/AT&T alliance.

The striking realization that comes to mind as one experiences Magic Link's capabilities is that as these devices become wireless, the usefulness of the device grows exponentially. Getting directions to the local restaurant or the next sales call ts nice today if you happen to be near an analog phone jack, but sending an agent to bring those directions back wirelessly while you're in the car or standing on the sidewalk is very compelling. Checking with the Official Airline Guide to see if your flight is late is much more compelling with a wireless connection.

Today, one-way paging, packet data networks such as RAM Mobile Data and ARDIS, and analog cellular are the only effective ways to provide wireless access. One-way paging is nice, but without two-way paging, sending agents to activate services necessitates reverting back to the wired infrastructure.

Future of wireless

In the next two years, Dataquest expects two-way paging networks based on the newly allocated personal communications services (PCS) narrowband spectrum to begin to provide cost-competitive wireless services that will enable Magic CAP-based devices to reach much of their potential. One major reason is battery life. PCS narrowband networks provide for end-user devices that are able to run for a month on AA batteries. Additionally, the nonduopolistic nature of the PCS narrowband networks should allow for enough price com-

Brown, *page 50*

Users take on upsizing

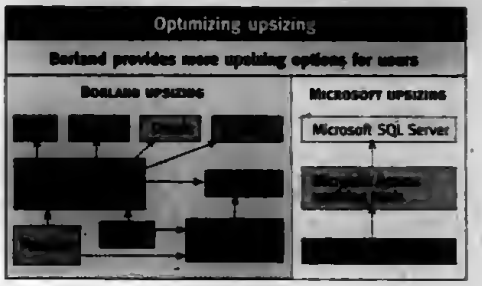
Key tools simplify migration tasks for in-house developers

By William Brandel

First there was downsizing. Now users increasingly need to scale up applications developed on PC databases. This exercise is called upsizing, and it ts gaining steam in the PC database industry.

Like downsizing, upsizing is an approach to moving an application to a client/server platform. Demand for upsizing results when users find that data running on a PC database application is critical enough to he distributed throughout the organization.

Until recently, npsizing has sounded easier than it is. Most nsers have had either to outsource their efforts or piece together tools and products to create their own models. Now vendors are beginning to offer some products that will make upsizing somewhat easier on some users.



Microsoft's entry

Microsoft Corp. has introduced technology that will enable its low-end database users to upsize. The Access Upsizing Tools allow users to npsize from Microsoft's Access PC database to Microsoft's SQL Server.

Its key tools are an Upsizing Wizard and a Browser. The wizard enables a user to move part or all of his Access-based applications to Microsoft's own SQL Server, said Scott Horn, Access product manager at Microsoft. For example, the user could select tables or indexes and then move these up to the SQL platform, where they could be accessed by other clients on the SQL-based system.

The browser enables Access users to reach the SQL Server to perform ad hoc queries, create or modify tables or run procedures. However, to upsize from Access, the user must have an all-Microsoft database environment.

Borland's offering

Borland International, Inc. — which has championed the upsizing credo since it pared itself down to a database and tools vendor after selling its Quattro Pro product line to Novell, Inc. — is taking a broader swipe at the market. Borland already offers a straightforward upsizing approach for its Paradox and dBase users to upsize to its SQL database, called Interbase, via Client/server Express.

Like Microsoft, Borland also faces a limited market in this regard, considering the small installed base of Interbase at nser sites, according to International Data Corp., a market researcher in Framingham, Mass. Now Borland is widening the options of its users by rolling out the Borland Database Engine (BDE).

BDE, which has been incorporated in some Borland products, is now being delivered as a

Upsizing, *page 49*



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Advanced Bus Architecture	PCI	VL		
Integrated Networking Interface	32-bit	16-bit		
Integrated, multiprotocol Boot-ROM	X	X		
ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[2]	X	X		

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INTEL TECHNOLOGY BRIEFING



FAST ETHERNET AND DMI: TWO NEW STANDARDS THAT PUT MORE CONTROL IN SIGHT.

Today's business environment is putting greater demands on our networks than ever before. Multi-megabyte e-mail, graphics and multimedia files are becoming quite common. But so are network traffic jams. And to complicate things further, the thousands of products that make our PCs so flexible are also making them harder to manage. In this brief, we'll tell you how Intel is working with other industry leaders to develop two new standards—Fast Ethernet and the Desktop Management Interface—to help you manage and control your network.

FAST ETHERNET

Given the demands on today's networks, even the most powerful PCs are becoming handicapped by 10 Mbps Ethernet. So in an effort to increase Ethernet throughput, Intel joined with other industry partners in 1993 to form the Fast Ethernet Alliance.



What resulted was a specification for ten times the original 10 Mbps bandwidth. The new 100 Mbps Ethernet provides all the bandwidth today's new technologies require while maintaining the original CSMA/CD protocol. Which means companies don't have to sacrifice their original Ethernet investment.

THE DESKTOP MANAGEMENT INTERFACE

But network traffic isn't the only place we're losing control. The more than 80,000 applications and products that can be added to the PC have made it much more flexible, but they've also made it more difficult to control because they have no common form of management.

That's why Intel formed the Desktop Management Task Force with companies like AST, Compaq, DEC, Dell, HP, IBM, Microsoft, Novell, SunSoft, Symantec and SynOptics. The goal was to create a technology that allowed manufacturers to design management capabilities and intelligence into their products.

Their answer was the Desktop Management Interface (DMI). DMI is a technology that defines a standard mechanism for accessing and configuring data in any piece of hardware or software.

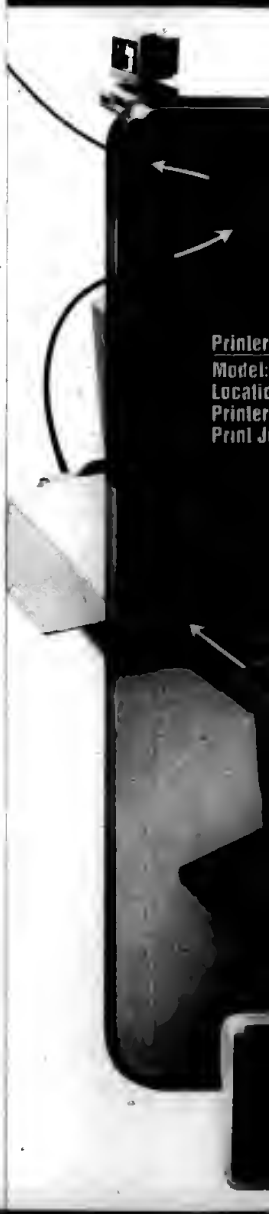
MANAGING THE PC'S MANY PIECES

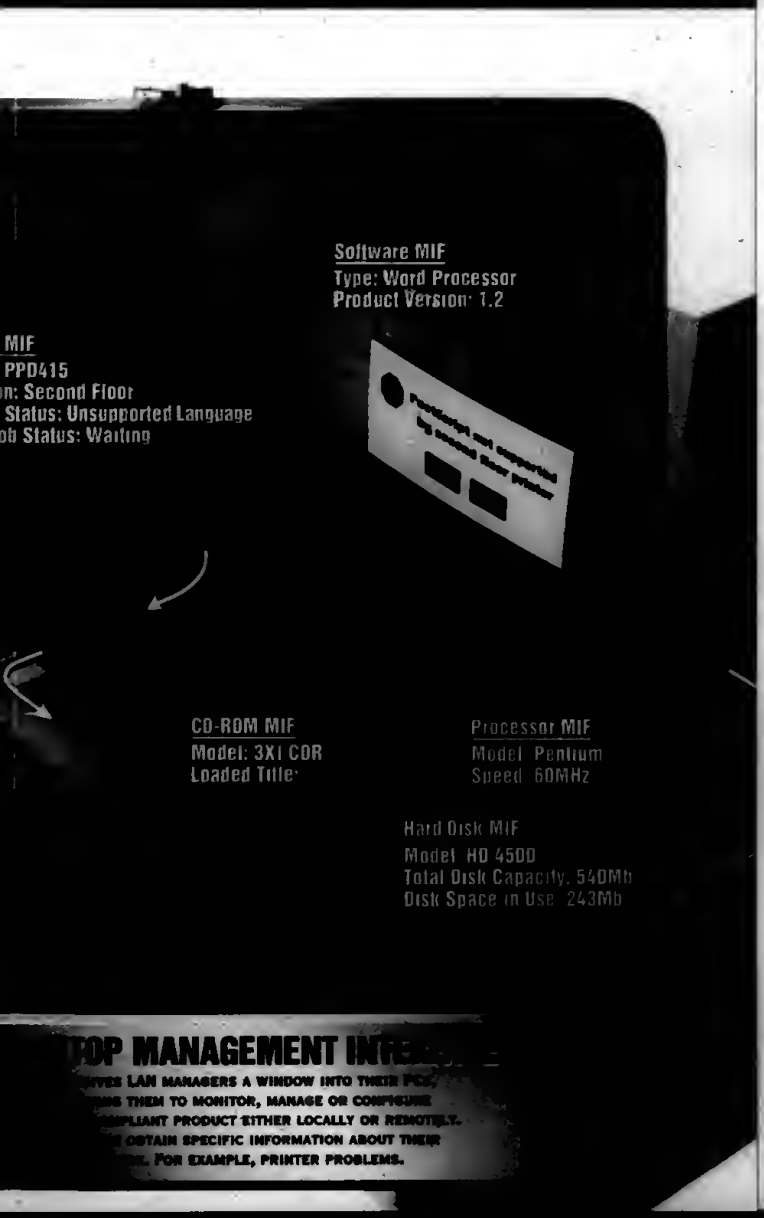


DMI ACTS AS AN INFORMATION RROKER, ERARLIRG A LAN MANAGER TO GAIR CONFIGURAYION DATA AROUT THE OESKTDP ARD ITS MANY PERIPNERALS ARD APPLICATIDRS. TAKE SOFTWARE DISTRIRUTION, FOR EXAMPLE. WITH A DMI-COMPLIANT MANAGEMENT APPLICAYIDR (LIKE INTEL'S LANDESK™ MANAGER SOFTWARE), A LAN MANAGER CAR TELL WHAT VERSION IS CURRENTLY RURRIRG, AS WELL AS GET IRFDRMATION AROUT YRE SYSYEM'S PROCESSOR, MEMORY AND DISK CAPACITY. TRIS ALLOWS RIM TO SET UP THE SOFTWARE RASED DR THE CONFIGURAYION AND FEATURES OF THE PARTICULAR PC, SIMPLIFYIRG THE IRSYALLAYION PROCESS.

TRDURLESNOOTING IS ALSO SIMPLIFIED RECAUSE DMI-COMPLIANT PRDDUCTS CAN SUPPLY IRFONMATION AROUT AN ERROR, REQUEST, OR UNEXPECTED EVENT. FON EXAMPLE, A DMI-CDMPLIANT PRINTER WILL RE ABLE YO CDMMURICATE THAY IT IS JAMMED DR OUT OF PAPER, RATHER THAR SERD A VAGUE "CANNOT PRINT" MESSAGE.

BEFORE DMI, A TRIAL AND ERROR PROCESS RAD TO RE PERFORMED TO FIRD OUT WHAT RESOURCES WERE ON A SYSTEM, AND OFTEN THE USER HAD TO RE ASKED TO LOOK UP THE DIFFERERY CHARACTERISTICS OF A MACRIRE. BUT TODAY, DMI PROVIDES A STANDARD WAY TO ACCESS THAY IRFDRMAYIDN.





OP MANAGEMENT INTE

VES LAN MANAGERS A WINDOW INTO THEIR PCS/ NG THEM TO MONITOR, MANAGE OR CONFIGURE MPLIANT PRODUCT EITHER LOCALLY OR REMOTELY. OBTAIN SPECIFIC INFORMATION ABOUT THEIR E. FOR EXAMPLE, PRINTER PROBLEMS.

How does DMI work?



Basicallt, DMI is software called the Service Layer and an ASCII database containirg Management Informatior Format files (MIF files).

Every DMI-compliant product such as a hard disk, CD-ROM, etc. has its own unique MIF describing its identifying characteristics like model number, serial number ano speed, as well as the device's manageable characteristics, such as a monitor's resolution.

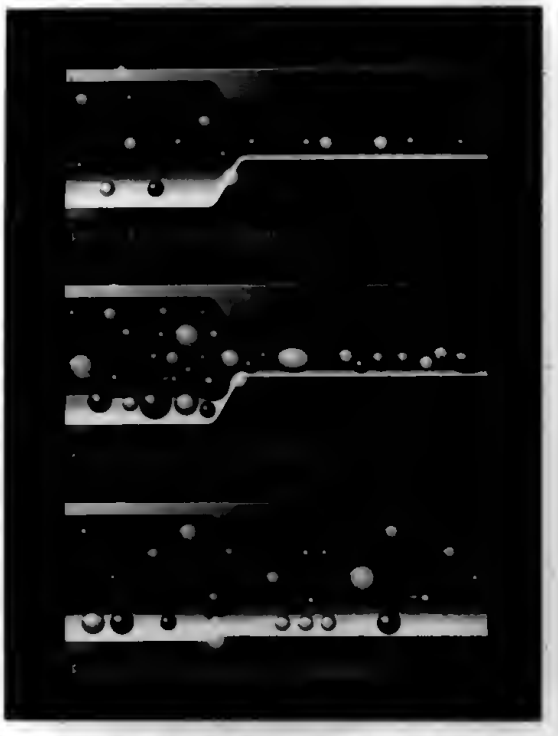


The Service Layer

When an application dr hardware product is installed, its MIF is passed to the Service Later and then stored in a database on the PC's hard drive. The Service Layer is software that resides in the operating system and acts as a traffic controller, handling all requests for data ir the MIF. The Service Layer dynamicallt notifies management applications of the new device, then makes irformation about that device available to other products—ever if they're from oifferent manufacturers.

INCREASING DEMANDS ON NETWORK BANDWIDTH

THE AVERAGE RUMRER OF USERS CONRECTED TO RETWORKS RAS ALMOST DOUBLED OVER THE PAST FEW YEARS. ARD THE RUMRER OF MESSAGES PER USER OR TRE RETWORK HAS GROWR AS WELL. BUT PERRAPS MORE IMPORTANTLT, THESE MESSAGES NAVE GROWN IR SIZE. FOR EXAMPLE, E-MAILS OFTER CONTAIR SEVERAL DOCUMERTS OR MULTIMEDIA ARD GRAPRICS FILES. ALL OF THIS PUTS A TREMERDOUS STRAIR OR RETWORK BANDWIDTH. BUT WITH TODAY'S FAST ETHERRET SPECIFICATIOR, THE ORIGIRAL 10 MRPS RARDWIDTH IS INCREASED TO 100 MRPS, PROVIDIRG MORE THAR EROUGR RDOM FOR THE LARGE RUMRER OF USERS TRARSMITTIRG LARGE QUANTITIES OF DATA OVER THE NETWORK.



WHAT DO DMI AND FAST ETHERNET MEAN TO INTEL PRODUCTS?

In addition to developing these two new standards, Intel is incorporating them into their new networking products.

For example, the new Intel EtherExpress™ PRO/100 adapter cards utilize the Fast Ethernet standard, making them the first network interface cards to integrate seamlessly into your Ethernet environment at both 10 Mbps and 100 Mbps.

Intel's entire line of EtherExpress PRO adapters supports the DMI specification. Which means a LAN manager, working from any DMI-compliant application, will be able to access information about the adapter's address, IRQ, drivers and more for maximum network control.

DMI will also be supported in the next version of Intel's LANDesk Manager software, providing a robust, end-to-end solution.



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Notebook season kicks into high gear

High-resolution screens latest addition to offerings

By Michael Fitzgerald

■ The autumn rush is on for notebook vendors, with a flood of products hitting the market in time for the traditional high-volume fourth quarter.

Toshiba America Information Systems, Inc. and NEC Technologies, Inc. have released high-end products that raise the technology bar, and the IBM PC Co. is expected to join them this week. Meanwhile, major player Compaq Computer Corp. focused on upgrading its high-volume Contura line, and smaller players are trying to get attention by hitting niches the majors have not pursued.

The announcements reveal market trends. All the major players are chasing performance. Toshiba's new T4900CT includes an Intel Corp. Pentium processor, the high-end chip that could be a harbinger as it makes its way into the notebook market. The Toshiba systems also offer a 10.4-in. active-matrix screen. With the T4900, Toshiba integrates a pointing device, the AccuPoint, which it licensed from IBM. This puts an end to Toshiba's status as the last major vendor without an integrated pointing device.

Vendor/product	CPU	Hard drive	Special features	Available	Price
Toshiba/ T4900CT	50/75-MHz Pentium	722M-byte	10.4-in. active color	November	$7,499
NEC/ Versa M TC	25/75-MHz, 33/100-MHz DX4	340M-byte, 540M-byte	24-bit true color	October	$5,399. $6,159
NEC/ Versa M HC	25/75-MHz, 33/100-MHz DX4	540M-byte, 810M-byte	800 by 600 resolution	October	$5,899 to $6,799
Compaq/ Contura 400	20/40-MHz DX2	250M-byte	9½-in. passive color, 5.9 lbs.	Now	$2,599
Panasonic/ V41	25/50-MHz 486DX2, 33/100-MHz DX4	260M-byte, 450M-byte	CD-ROM, 10.4-in. active or passive color	Now	$4,299 to $7,799

Pretty picture

NEC, meanwhile, said its screens will be brighter and feature higher resolution. The new Versa M has conventional passive- and active-matrix color screens but also comes in versions with 24-bit true color and an 800- by 600-pixel screen. The true-color screen will boost brightness by 30% over a typical active-matrix color screen.

Analysts and vendors have said the 800- by 600-pixel screen will become a de facto market standard next year, when Sharp Corp. begins manufacturing screens with that resolution. NEC is targeting a ship date of later this month for its new screens.

"High-resolution screens make more work visible, so accountants can see more of their spreadsheet, for instance," said Cynthia J. Davis, a senior product manager at NEC. She added that users accustomed to having higher resolution on their desktop screens would now have them on notebooks.

One to one

International Data Corp. projects that the current ratio of four desktops sold for every notebook will shrink as corporate belt-tightening and vendor price cuts combine to push a one-employee, one-notebook scenario.

Another feature new to notebooks is an integrated, full-size CD-ROM. While Texas Instruments, Inc. TravelMate notebooks have been available with a CD-ROM module attached to the bottom, Panasonic Personal Computer Co.'s V41 notebook offers the first 5¼-in. CD-ROM built in to the regular notebook. Though the product, at up to 9.1 pounds, is heavy, it does represent a substantial technology breakthrough.

IBM is expected to follow suit, which will probably force other vendors to respond to the technology as well.

Pentium-powered

Meanwhile, Midwest Micro, a small company in Fletcher, Ohio, announced a notebook based on Intel's 60/90-MHz Pentium processor. This appears to be the first notebook on the market to use the 90-MHz Pentium.

"There is a closing of the gap in performance between desktops and portables," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Stephen said that next year, use of Pentium chips will become more widespread. He also predicted that larger active-matrix screens will be easier to make, and prices on these high-end screens will drop. "That will create some nice feature sets in the midrange of the market," Stephen said.

Meanwhile, Compaq's upgrade to its Contura high-volume midrange line brings Contura more on a par with other midrange products. Compaq took the notebook's basic 2-year-old design and added a new trackball, a faster processor and PCMCIA. It also put "feet" on the bottom, to give users the option of having a 4-degree typing angle.

Upsizing

CONTINUED FROM PAGE 45

development tool set for Windows application developers who use C, C++ and Pascal languages. By implementing BDE, these developers gain access to multiple data sources through a common application programming interface. For example, when using Borland's upsizing tools, a programmer could upsize a Paradox or dBase application to any SQL server platform or to IBM's DB2. By comparison, Access users are limited to starting from Access and upsizing only to SQL Server.



There is, of course, a catch. Borland's strategy offers more options and platforms to move to and from, but it requires more tools. However, users say that if the tools allow them to get more mileage out of their developed code and applications, then the procurement of the tools is worthwhile.

"It is important for an organization to have database front ends that can hook into all of their major databases," said Ralph Mickelson, a partner at OmniVision, a development consultancy in Highland, Calif. In addition to developing with Borland technology, OmniVision is a Microsoft Solutions Provider.

"If your developers are using C or C++ or Pascal, it matters that this code can be used to provide those hooks," Mickelson said. "That is what is good about BDE, the flexibility. You can do a SQL statement for connection through Paradox to Sybase or anything else."

While upsizing usually does not require the same amount of development work as a legacy downsizing effort, it still does not come cheap. Once development time, new tools, new servers, networking and hardware changes are taken into account, it would cost an organization from $50,000 to $500,000 to outsource this type of project, said Paul Sharp, president of System Reeng, Inc. in Camarillo, Calif. The cost variable is based on the scale of the project, Sharp said.

Users win

Analysts note that both Microsoft's and Borland's strategies are heavily dependent on users using a great deal of just one of the vendor's product lines. However, for users looking to upsize, low-cost tools that ease their efforts are still good news.

While there are now no solid market numbers to quantify the size of the upsizing market, some analysts estimate that 35% of the 12 million-plus PC databases now in use at user sites will move into the client/server realm in the next few years. Other figures indicate that 500,000 users will upsize per year, while another 500,000 will rewrite their PC database applications for SQL from scratch.

Available now, the Microsoft Access Upsizing Tools are priced at $99. The Borland Database Engine 2.0 for Windows is priced at $395. Paradox users can upgrade for $149.95.

Briefs

Going home

The wooing of the home market by major desktop vendors continues. Compaq Computer Corp. recently announced a Presario consumer series line that features speakerphone, cable-ready TV, CD-ROM sound system, fax machine and a computer at prices ranging from $1,400 to $1,800.

486 may beat out Pentium

Intel Corp. may be spending $150 million on advertising to push Pentium in the U.S. and Europe, but it expects to see the 1486 rule the rest of the world for years to come. Intel and Advanced Micro Devices, Inc. officials, speaking at an industry trade show, said deep price cuts on the 1486 next year will help it explode in the non-Western world, according to Martin Reynolds, a Computer Intelligence/InfoCorp analyst who was chairman of the panel on which the remarks were made. "They said that the cost will be much cheaper than [that of] Pentium, and that will make 486s more attractive than Pentium to people in low-income nations," Reynolds said.

IBM licenses chips

IBM announced it has agreed to license its PowerPC Series 600 chips to Toshiba Corp., which plans to use them in a variety of systems.

Brown

CONTINUED FROM PAGE 45

petition that the services will be affordable for nonexecutives.

Telescript is the key contribution from General Magic. Much as Adobe's PostScript changed the face of publishing in the 1980s, Telescript could change the face of communicating in the 1990s if it becomes a major standard. As device makers, service providers and network service providers adopt the standard, the communications services available to end users will grow. The adoption of a standard is difficult because of the chicken-and-egg nature of a standard. Why would service providers create services unless there is an installed base of users who will buy them? Why would people buy devices to gain access to services if no services are available?

Initially, Adobe's PostScript was unimportant because it lacked key parts of the infrastructure needed to make it useful. However, once Aldus, Apple and Adobe created and popularized PageMaker, the Macintosh and LaserWriter, desktop publishing was born. In the case of Telescript, the "killer app" is very easy-to-use E-mail.

Two major changes must take place before the platform can be a major success. First, many more compelling Telescript-enabled applications must be created to drive the proliferation of devices, which in turn will drive more applications. Second, wireless communication must become ubiquitous and affordable. I expect several applications to appear that over time can drive device volumes as the devices add better features and become more affordable. This process will take at least a few years, and manufacturers' expectations must be small at first.

The competition will be tough. Apple's Newton is not doing well, but it is not dead yet. HP may be able to make the Geos operating system a standard if it decides to commercialize it as a follow-on to the 200LX handheld. And no matter what else occurs in the next year, Microsoft will come out with a handheld operating system and automatically be able to run Visual Basic applications — something just about every corporate developer wants.

The WinPad operating system's affinity with the tens of millions of Windows desktops and notebooks will be compelling for many handheld buyers.

The race is on.

Brown is vice president of mobile computing at Dataquest, Inc. in San Jose, Calif.

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PATENT PENDING

Briefs

Apple shows new face

Apple Computer, Inc. recently unveiled a two-faced logo that it and its partners will use to show compatibility with Apple's operating system. The cubist-style smiling face will be available to compatible hardware vendors — including eventual operating system licensees — and software vendors, said Apple creative director Gaynelle Grover. The logo is part of a marketing push in which Apple will eventually change the name of System 7.5 to Mac OS.

Insignia unveils program

Insignia Solutions, Inc. has introduced an enhanced version of its Windows emulation program for 680x0-based Macintoshes. On average it offers 20% performance improvement over current versions.

Apple increases storage

Apple, which reversed its premium pricing strategy in March when it unveiled the aggressively priced Power Macintosh line, stayed that pricing course earlier this month, increasing hard drive storage on most Power Macintoshes without raising prices. The 160M-byte version of the 8100/80 will climb to 250M bytes for the same $1,819 price; the 250M-byte 7100/66 will go to 500M bytes for $2,899; and the 8100/80 will jump from 250M to 500M bytes for $4,249.

THE PROMISE OF WINDOWS NT HAS FINALLY BEEN DELIVERED.

Virus detection

Australia squashes viruses, saves data

By Peter Young
SIDNEY, AUSTRALIA

■ The amount of data damage caused by computer viruses appears to be leveling off, at least according to one study in one part of the world: Australia.

Dr Disk, a national data recovery and data conversion specialist company, reports that virus attacks generate about 10% of its data recovery business. But that percentage is static or showing only marginal annual growth even though the number of new and variant viruses is still ballooning. It suggests users here have the tools and policies in place to contain the virus problem.



Turn for the worse

At the same time, virus writers have become more malicious, according to Derek Conibear, national sales and marketing manager at Dr Disk. "Viruses that wrote a funny message on your screen used to be common. These days, virus writers' intentions appear to be far more destructive. They are writing with the intention of disrupting the activity of users by trashing their hard disks," he said.

Only a small percentage of viruses render data totally unrecoverable by overwriting data files.

The majority of viruses target boot sectors and partition tables, and companies such as Dr Disk can recover data in most cases by using specialized utilities. However, the process can be tedious and time-consuming, Conibear said. For a 210M-byte hard drive, the recovery operation would typically take four or five hours but could stretch to as long as four days if a disk's file allocation table was also destroyed.

Dr Disk operates on a fixed scale of $350 for the first megabyte of restored data and $3.70 for each megabyte thereafter. Meanwhile, dax bulletin board service operators continue to play into the hands of virus writers. At least one Victorian bulletin board system in the past few weeks has helped spread a virus masquerading as a version of McAfee Associates, inc.'s antivirus software, Conibear said.

It is identified as Supascan 1.0 and contains executable and text files that look similar to a legitimate McAfee product. But it will trash hard-disk boot and partition information and display the name "Insight" when run.

Young is a Computerworld Australia correspondent.

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–Allison Engine

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[redacted]

Hewlett-Packard Co. has announced the HP Color LaserJet Printer.

According to the Palo Alto, Calif., company, the HP Color LaserJet Printer was designed for corporate users and prints up to two full-color pages per minute.

The printer can print black-only pages at normal HP LaserJet speeds. A color-palette cache stores the most frequently used colors, and HP ColorSmart software automates color controls.

The HP Color LaserJet Printer comes with 8M bytes of RAM and an HP Bi-Tronics bidirectional parallel port. The printer is optimized for HP PCL and Adobe, Inc. PostScript Level 2 printing.

The HP Color LaserJet Printer costs $7,295.

▶ *Hewlett-Packard*
(415) 857-1501

Capsoft Development Corp. has announced HotDocs 2.0 for Windows, intelligent template software.

According to the American Fork, Utah, company, HotDocs 2.0 builds templates with Microsoft Corp.'s Word, Novell, Inc.'s WordPerfect and Lotus Development Corp.'s Ami Pro by converting word processing documents into smart templates.

Features include a standard office template package, a library feature to organize templates, an insert file feature and an optional database module.

HotDocs 2.0 costs $99.

▶ *Capsoft Development*
(801) 763-3900

Kubota Graphics Corp. has announced ActionGraphics 300, a workstation-class three-dimensional graphics accelerator.

According to the Santa Clara, Calif., company, ActionGraphics 300 provides full 24-bit color, dynamic rotation and dynamic manipulation of shaded solid and wire-frame models.

The product runs on a standard Pentium PC with a Peripheral Component Interconnect bus.

ActionGraphics 300 costs $2,195.

▶ *Kubota Graphics*
(408) 727-8100

Lexmark International, Inc. has announced the WinWriter 100, 200 and 400 printers for Windows.

According to the Lexington, Ky., firm, WinWriter 100 provides monochrome printing, and WinWriter 200 prints four pages per minute.

WinWriter 400 prints five pages per minute at 600 dot/in. quality resolution.

Prices range from $279 to $749.

▶ *Lexmark International*
(606) 232-2000

Zenith Data Systems has announced the color Z-Lite lightweight notebook computer.

According to the Buffalo Grove, Ill., company, the color Z-Lite features a 7.8-in. VGA screen with simultaneous video capabilities that let users run an external color monitor for presentations.

The notebook operates at 33 MHz and includes a 32-bit data path, 1K byte of internal cache, two PCMCIA Type II slots and Home Row, Inc.'s J-Mouse integrated pointing device embedded in the J key.

The color Z-Lite costs $1,799.

▶ *Zenith Data Systems*
(708) 808-5000

Micronet Technology, Inc. has announced the DAT Autoloader, digital audio tape (DAT) data storage for PCs and Macintoshes.

According to the Irvine, Calif., company, DAT Autoloader features DDS-2 technology that provides high compression rates.

The product provides unattended backup of up to 48G bytes of data, and the PC version is compatible with Cheyenne Systems, Inc.'s Arcserv software. The Macintosh version includes Dantz Development Corp.'s Retrospect Remote product.

DAT Autoloader costs $4,295.

▶ *Micronet Technology*
(714) 453-6000

Chili Pepper Software has announced Infinite Disk 2.0, hierarchical storage management software for Windows.

According to the Atlanta firm, Infinite Disk 2.0 compresses or archives inactive files and provides a Windows File Manager interface, a graphical hard disk analysis tool and an autoscheduler for background file management.

Each migrated file still appears to the user to be on the local drive, and when a migrated file is accessed, it is decompressed or recalled from off-line media without disturbing the application in use.

Infinite Disk 2.0 costs $129.

▶ *Chili Pepper Software*
(404) 339-1812

Verbex Voice Systems, Inc. has announced Listen for Windows 2.0, speech recognition software.

According to the Edison, N.J., firm, Listen for Windows 2.0 features automatic building of speech interfaces for most Windows applications and customized speech interface commands.

The product is speaker-independent for North American dialects and provides continuous speech recognition.

Listen for Windows 2.0 costs $139.

▶ *Verbex Voice Systems*
(908) 225-5225

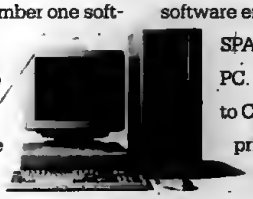
Product shorts

Alps Electric, Inc. has announced Alps GlidePoint, a touch surface pointing device. Users glide a finger across the Alps GlidePoint surface and tap lightly on the surface to perform a double-clicking function the same way as a mouse. The GlidePoint driver lets users change the acceleration curve, choose cursor size and program hot spots. The third button can be programmed for specific functions. The product measures 2 in. by 1.9 in. and was designed for both portable and desktop PCs. Cost: $96: Alps Electric, San Jose, Calif. (408) 432-6000.

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We'd like to tell you about a 32-bit software environment that delivers performance, not promises. It's called Solaris. With over 1.8 million users, Solaris is the number one software environment for global enterprise networks.[1] It's also the highest volume database engine running Oracle, Sybase and Informix, the most widely used multiprocessing software environment and even the dominant gateway for the information superhighway. Solaris runs over 9300 32-bit solutions,[2] as well as Macintosh, DOS, and Windows applications like Microsoft Office and Lotus SmartSuite. It's not picky when it comes to hardware, either. It's the only 32-bit software environment that runs on x86 PCs, SPARC® systems, and soon, even Power PC. And it's scalable from 486 laptops to Cray superservers. Solaris is enterprise ready, too. Unlike PC desktop based environments, it offers the most popular system and network management tools in the industry, so you can finally get your enterprise under control. From PCs to mainframes, nothing moves, monitors and manages information better. All of this capability means that with Solaris, you don't have to compromise your existing hardware and software investments. And Solaris is, of course, backed by the most experienced client/server support organization in the world. Now, you're probably wondering why you should wait for the promise of NT when you can get Solaris now. Exactly. So call us at 1-800-SUN-SOFT, or contact us on the Internet at http://www.sun.com/



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IBM

Systems management tools

DG serves up Unix tools, support at expo

By Thomas Hoffman
NEW YORK

The recent Unix Expo trade show may have lacked the blockbuster product introductions of previous conferences, but systems management vendors wasted little time showcasing their tools before 30,000-plus would-be customers.

Perhaps the most intriguing set of announcements came from a new entrant to the market — Data General Corp. — which launched a set of workstation-based tools designed to manage its DG/UX Unix environment and its Clariion disk array storage subsystems.

In addition, DG inked a strategic relationship with Tivoli Systems, Inc. in which the Westboro, Mass., computer maker will bundle Tivoli's Tivoli Management Environment (TME) systems management package with each version of DG/UX. The Tivoli relationship follows a previous agreement DG had reached with Computer Associates International, Inc., which supports DG/UX with its CA-Unicenter systems management tools.

DG also added one of its own offerings, DG/UX Manager, a graphical user interface (GUI) tool for monitoring and assessing Aviion system resources at any point on a network, and DG/UX Clariion Manager, a GUI tool for managing Cla-

DG, *page 60*

Sun fuels server race with beefed-up Solaris

By Jean S. Bozman
NEW YORK

Sun Microsystems, Inc. boosted the performance of its high-end Unix symmetrical multiprocessor (SMP) servers at the recent Unix Expo with hardware speedups and improvements to its Solaris 2.4 Unix operating system. Users and analysts said the moves will fuel Sun's push to compete with commercial servers from IBM and Hewlett-Packard Co. (see story page 60).

The new SPARCserver 1000E and SPARCcenter 2000E models have faster RISC processors and system buses that, taken together, boost server performance by 25% to 70%, Sun said. At the same time, Sun's SunSoft, Inc. subsidiary said it would soon ship Solaris 2.4 for Sun servers, boosting processing speed by about 25%. However, Sun stopped short of providing audited benchmark numbers.

Industry analysts said the moves will help Sun promote its image as a server vendor. Servers constituted about 20% of Sun's $4.3 billion in sales last year. Carl Stolle, director of server product marketing at Sun Microsystems Computer Corp., said Sun had sold more than 6,000 SPARCserver 1000s and more than 1,000 SPARCcenter 2000s in the past 18 months.

UNIX EXPO

Price range

Sun Microsystems Computer introduced 60-MHz SuperSPARC versions of its SPARCserver 1000 and SPARCcenter 2000 SMP Unix servers at the expo. SPARCserver 1000E prices range from $54,300 for a two-way system to $176,350 for an eight-way system. SPARCcenter 2000E prices range from $124,795 for a two-way system to $659,395 for a 20-way system.

Processor count growing

"They're being very aggressive with their pursuit of SMP," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Most vendors say the sweet spot [for Unix SMP servers] is four to six processors, but they're clearly going for eight on the SPARCserver 1000 and as many as 20 on the SPARCcenter 2000."

Some users said they are glad Sun is addressing concerns about high-end performance resulting from saturated system buses under certain I/O inten-

Sun, *page 60*

Cabletron offers Token Ring port switching with 18-product rollout

By Stephen P. Klett Jr.

Internetworking vendors continue to make moves to appease corporations with large Token Ring LANs that are encountering bandwidth troubles.

While problems such as network bottlenecks and slow response times are well documented in the Ethernet world, vendors have only recently begun to address them en masse in the Token Ring market [CW, July 25].

Cabletron Systems, Inc. in Rochester, N.H., got into the game last week, unveiling a series of Token Ring connectivity modules for its Multimedia Access Center line of hubs (Mmac) that provides port-switching capabilities without requiring users to modify equipment.

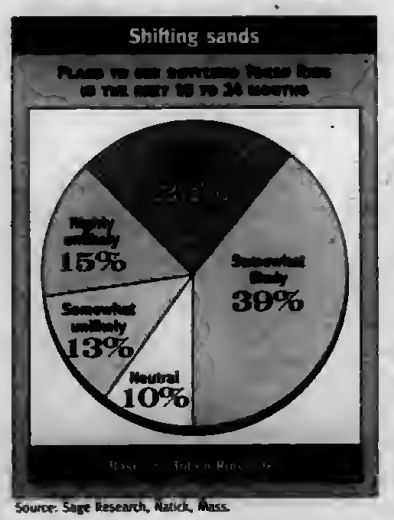
Port switching allows administrators to break large network segments into smaller rings to improve network performance and boost individual user bandwidth.

Token Ring here to stay

Cabletron's 18-product rollout includes 12- and 24-port modules that support individual port switching for any of four rings supported by the Mmac backplane, as well as two additional rings located on the modules themselves. Two- and four-port Token Ring management modules allow users to control individual ports on up to four rings. All modules are scheduled to ship in January at prices ranging from $2,795 to $10,995.

"It's clear Cabletron doesn't want to worry its Token Ring users that it's leaving them behind with its emphasis on Ethernet switching" in the Mmac-Plus, said Glenn Gabriel Ben-Yosef, an analyst at The Yankee Group in Boston. "Token Ring is going to be around a long time, and those folks who have to access host data are definitely going to stay with it."

This was the finding of a Token Ring market survey by Sage Research in Natick, Mass., which found a high level of planned investment and expansion among Token Ring sites. For example, the study found that 85% of 77 Token Ring users surveyed planned to expand their networks in the next 18 to 24 months and many planned to evaluate switching technology (see chart).



Source: Sage Research, Natick, Mass.

According to Sage Research, large Token Ring sites are not looking to implement Ethernet technology as they expand, but rather are looking to preserve and build on their investment in Token Ring. "Organizations with large Token Ring networks are dedicated to them and plan to continue investing in them," said Kathryn Korostoff, president of Sage Research.

Tom Nolle, president of Cimi Corp. in Voorhees, N.J., agreed. "Why would you want to go with Token Ring today when Ethernet is so much cheaper? Simple. It's not cheaper if you already have Token Ring. Large users such as Fortune 500 companies cannot justify the conversion," Nolle said.

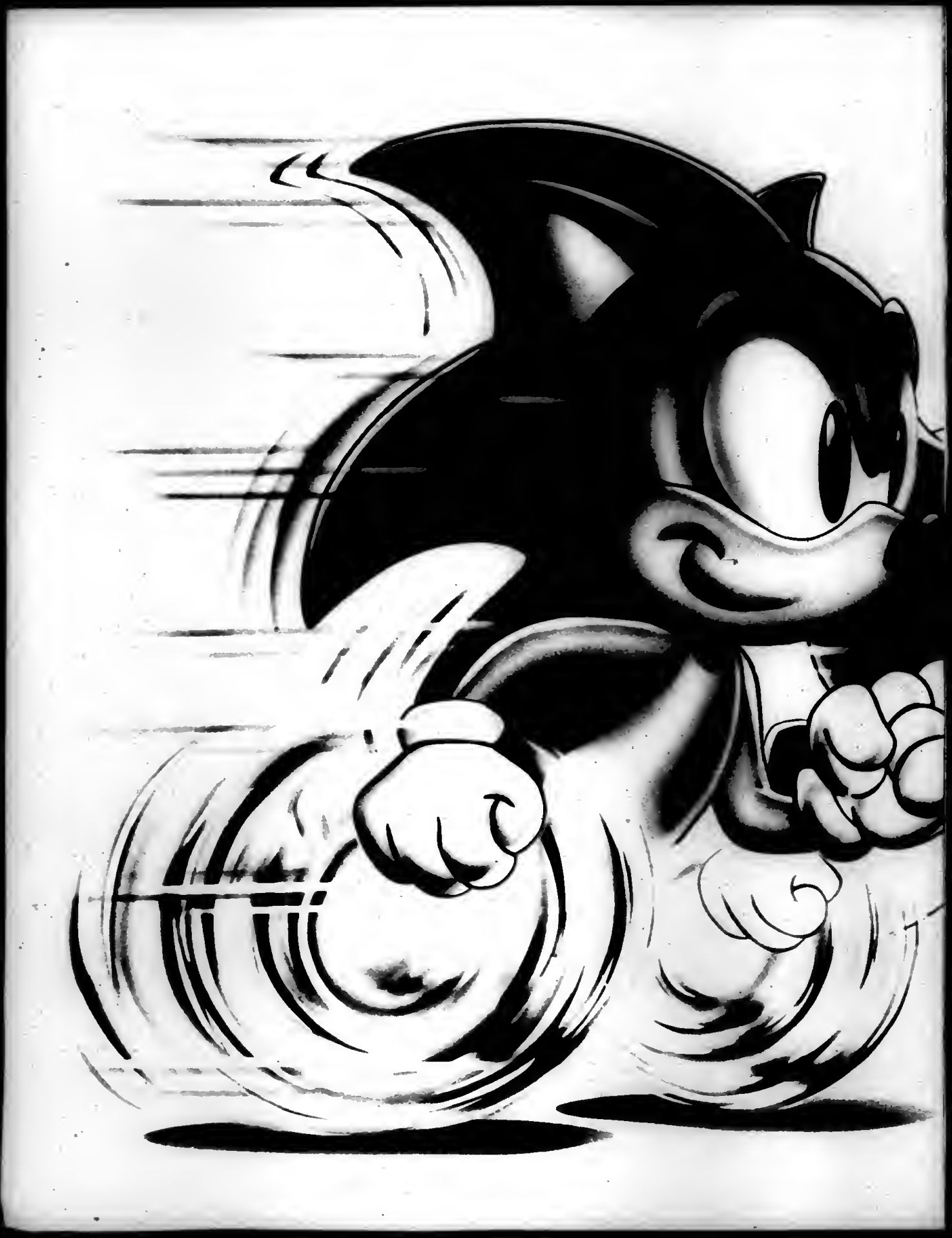
Easing the flow

Meanwhile, users are looking at switching products as a means to alleviate network congestion related to bandwidth-hungry client/server applications.

"We've got a lot of shared-access devices on our network and are looking at switching as a way to dedicate bandwidth to improve performance," said Graham Morrison, project leader at Token Ring shop Blue Cross/Blue Shield of Connecticut in Hartford. While the insurance provider uses Cabletron hubs, it is also beta-testing Centillion Networks, Inc.'s Speed Switch 100.

Blue Cross plans to use switching to boost bandwidth for specific users as it transitions to client/server, Morrison said. "Bursty traffic generated by applications such as Visual Basic is slowing our network down periodically; switching should help eliminate this," he said.

Cabletron also included a LAN extension module for the Mmac-Plus in its rollout. The module provides collapsed backbone connectivity for up to 28 Token Ring networks. The Mmac-Plus's previous limit was 14 rings. The module will be available in January for $13,995.



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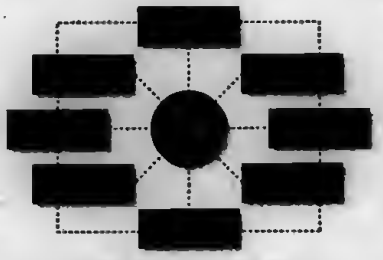


"Thanks to CA-Warehouse Boss," our warehouse was able to ship more games in September, '93 than we did in the past two years," says Bill Downs, Director of MIS for SEGA of America, Inc., the makers of the world's fastest moving video games like Sonic The Hedgehog.

CA-Warehouse Boss is totally integrated warehouse management software for the AS/400. It acts as "the central nerve center" that tracks every detail from arrival through departure.

"Not only has order turnaround time been drastically reduced, but we've achieved close to 100% shipping accuracy. Shortage claims have been virtually eliminated," says Downs.

And because CA-Warehouse Boss is built using an advanced architecture, it can grow with any operation without costly custom programming.



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IBM delivers on SMP server promise

Analysts call pricing 'surprisingly high'; users not so concerned

By Jean S. Bozman
NEW YORK

IBM's new symmetrical multiprocessing (SMP) servers will fit the bill for high-end Unix processing at thousands of IBM RS/6000 user sites, but industry analysts said last week that initial prices for the PowerPC servers are higher than expected.

The servers, announced at Unix Expo, will compete with Hewlett-Packard Co.'s HP 9000 Unix servers and Sun Microsystems, Inc.'s SMP servers, according to analysts.

Some analysts said the pricing was surprisingly high considering that the combination of four PowerPC 601 RISC processors may not significantly outpace IBM's high-end RS/6000 Model 900 uniprocessors. However, the pricing will be offset by IBM's offer to upgrade the current crop of PowerPC 601s to PowerPC 604 chips at no additional charge when those chips ship early next year.

100% improvement

The free PowerPC 604 upgrade will precede later upgrades to six- and eight-way SMP servers, analysts said. But the 604 replacement alone will greatly boost speeds.

"You've got something between a 50% and 100% performance improvement coming," said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "That's built into the price, and that makes it a lot more competitive."

A second wave of upgrades, to the even more powerful PowerPC 620 chips, is set for late next year, he added.

Some users said they are more concerned about upward migration from current machines than about IBM's SMP price tags. "Unix systems have got to be pretty darn competitive because if they're not, the pain of conversion [to other vendors] isn't that bad," said John Shiels, vice president of information systems at J. M. Huber Corp. in Edison, N.J. The large manufacturing and energy firm uses 15 RS/6000s worldwide and will complete an IBM ES/9000 mainframe downsizing project by October 1995.

"This gives me a feeling of confidence that IBM has delivered what they promised to do, and it gives us a sense of upward mobility," Shiels said.

He added that his firm may not need to buy more RS/6000s until the 604 upgrade ships.

Other users remain more interested in seeing other facets of IBM's Unix products strategy, including low-end RS/6000 workstations in IBM's PowerPC-based Power Personal product line. IBM announced one of these user-friendly desktops at Unix Expo: the $3,995 RS/6000 Model 40P, which ships with a preinstalled copy of AIX.



Users interested

"We are starting to move toward file servers, very slowly, so we're interested in the new stuff that's coming up," said Caron Stein, computer manager at Skidmore, Owings & Merrill, an architectural firm in Chicago.

Stein said she wants to evaluate IBM's RS/6000 C10 minitower, introduced earlier this year, as a file server and look at low-end RS/6000 workstations for use as architects' design workstations. The company already has more than 100 RS/6000s.

DG serves up Unix tools

CONTINUED FROM PAGE 57

rilion disk arrays on Avilon systems. Both systems can interface with Tivoli's TME architecture and Hewlett-Packard Co.'s OpenView network management system. DG's Windows-based tools are able to provide enterprisewide management through the Simple Network Management Protocol.



DG's DG/UX Manager *is a GUI for monitoring and assessing Avilon system resources at any point on the network*

DG's new offerings — combined with its Tivoli and CA-Unicenter support — were designed to provide customers with a full set of systems management options, according to Francis X. Kenney, manager of Avilon software at DG. "We offer Unicenter for people who want a data center style of systems management, while Tivoli provides a more heterogeneous approach for those people who are looking to solve one or two problems, like software distribution," Kenney said.

DG's approach makes sense because systems management tool buyers seem to fall into one camp or the other, analysts said.

"The people who buy into the Tivoli tool set are different than those buying into Unicenter. Unicenter has more of a mainframe look and feel while Tivoli has more of a distributed look and feel," said Jonathan Eunice, research director at Illuminata, a Hollis, N.H., consultancy.

DG/UX Clariion Manager is priced at $2,000 per server and $150 per agent. Typical server and workstation configurations for the DG/UX Manager are priced at less than $1,000. The products are scheduled to begin shipping in December.

Express for you

Operations Control Systems in Palo Alto, Calif., released its automated job scheduling package, Express for Unix, for IBM's RS/6000 and Sun's SPARCstation platforms. Express for Sun and Express for IBM RS/6000 pricing begins at $5,000.

Working out the bugs

As expected, CA also announced at the show shipments of its CA-Unicenter/Star software, an IBM OS/2 workstation-based cross-platform systems management package [CW, Oct. 3]. CA also announced that its CA-Unicenter package will support IBM's SOM-objects for MVS/ESA object-oriented development environment.

Meanwhile, CA executives said CA-Unicenter Version 1.1 software has been in beta testing since early August. The second-generation systems management package will include tighter integration with HP's OpenView and IBM's NetView/6000 network management suites, according to Yogesh Gupta, CA's senior vice president for open systems. Gupta said CA-Unicenter 1.1 will begin shipping by the end of the month on IBM's AIX, Sun Microsystems, Inc.'s Solaris and HP's HP/UX operating systems.

4th Dimension Software Ltd. in Tel Aviv unveiled Control-SA and Enterprise SecurityStation, a set of workstation-based multiplatform security administration modules. The packages, which are to begin shipping in the first half of next year, work together to provide centralized security across IBM's MVS and several Unix operating environments from a single point on the network. Enterprise SecurityStation will start at $9,000, while Control-SA will be priced on a per-platform basis for IBM's MVS, Novell, Inc.'s NetWare and the Solaris and HP/UX platforms.

The 4th Dimension tools represent one of the first attempts to unify mainframe and Unix security, Eunice said. "People are beginning to see that the mainframe should be part of the distributed systems management model and not separate from other operating environments," he added.

Sun's Solaris

CONTINUED FROM PAGE 57

sive work loads. Users of some high-end servers have reported uneven application scaling as CPUs are added [CW, Oct. 3].

The higher degree of parallelism being built into Sun servers will boost performance, explained Jim Stikeleather, a partner at the Technical Resource Connection, a Tampa, Fla., open systems consultancy. But users must rewrite applications to make full use of parallel systems, he said. "It's going to be the people who know how to take advantage of multithreading who are going to get significant benefits from all the stuff Sun is doing," Stikeleather said.

Roger Holtom, a consultant at Ciba-Geigy International's chemicals division in Greensboro, N.C., who spoke at a Sun seminar at the expo, said server clustering would aid uptime — but so would using distributed databases on SPARCserver 1000s at multiple sites. And many analysts noted that multithreaded programming is still in its infancy, so many users rely on relational database vendors to take automatic advantage of multithreading for built-in database features.

More support on the way

Also at Unix Expo, Sun announced future support for Oracle Corp.'s 7.1 Parallel Server software through the release of clustered Sun hardware systems. The SPARCserver and SPARCcenter Parallel Database servers are expected to ship in the first quarter of next year.

Based on a software module called a distributed lock manager, the clustered Sun systems will redirect users' queries to mirrored copies of an Oracle database in the event one server system should fail.

Prices for the clustered Sun servers will range from $387,025 for a two-way SPARCcluster 1000 to $683,175 for a two-way SPARCcluster 2000.

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Midrange market sees performance up, prices down

By Jaikumar Vijayan

Emerging PC technologies such as Peripheral Component Interconnect, symmetrical multiprocessing and a new generation of high-performance processors may be driving better midrange price/performance, according to a recent report by research firm Computer Intelligence/InfoCorp.

Since 1989, performance of midrange systems has increased more than sixfold. Meanwhile, price per MIPS has plummeted more than eightfold in reaction to trends in the PC market, which in turn has fueled market growth, according to the report.

Staying on top

However, midrange systems will have to maintain much higher performance levels than PCs at nearly the same price/performance ratio if they are to stave off the challenge from the rapidly emerging PC technologies, the report said.

Commenting on the trend, Lynn Berg, vice president of distributed computing strategies at Gartner Group, Inc. in Stamford, Conn., noted, "What will have to happen is that [midrange] vendors will have to find other ways to differentiate themselves" from PC technologies.

Berg said that as price and competitive pressures increase, traditional midrange vendors will have to provide differentiation with technologies such as massively parallel systems, high fault tolerance and clustering features that are "not easily transferable from vendor to vendor."

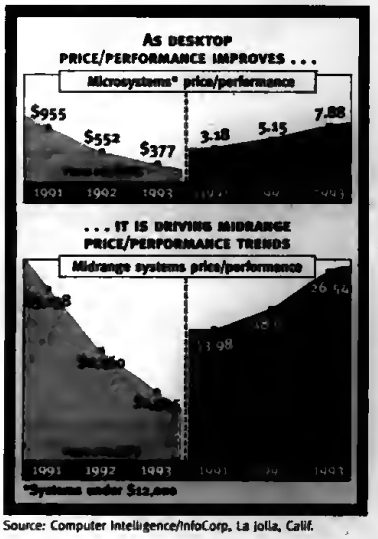
Users agreed that midrange vendors will have to do more to hold their interest.

"Midrange machines have, as a general rule, faster I/O capabilities, faster and more extensive storage possibilities and a wider range of high-performance scalable operating systems," said Matthew Ivaliotes, a network administrator at the University of Illinois at Urbana-Champaign.

According to Ivaliotes, midrange vendors would do well to augment these features of their machines, focusing on bus architectures, hard-disk arrays, or their alternatives, and software.

Maybe migration

The university has already investigated whether to replace some functions of midrange machines with multichip Intel Corp.'s Pentium and Novell, Inc.'s NetWare or Microsoft Corp.'s Windows NT Advanced Servers, for instance, he said. The university may migrate such features as mail service and other basic network services.



Source: Computer Intelligence/InfoCorp, La Jolla, Calif.

The Computer Intelligence/InfoCorp report suggested that most of the growth in the midrange segment — with average system prices ranging from $12,000 to $1.75 million — has been spurred by trends in the PC space. For instance, the report concluded that the impact of PCs on the sub-$12,000 price range has been impressive. In the past five years, PCs have driven the cost of computing performance to less than $400 per MIPS, while the MIPS per system has increased fivefold during the same period, according to Computer Intelligence/InfoCorp.

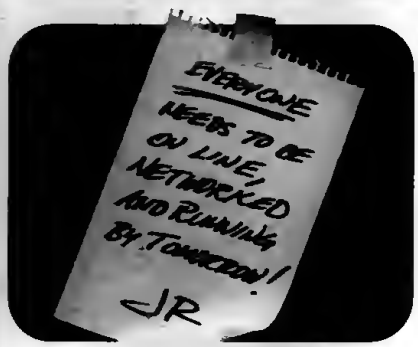
Transitions in the market

According to the report, midrange vendors will have to advance in microprocessor MIPS ratings as well as system bus performance and systems memory design to remain competitive with PC vendors.

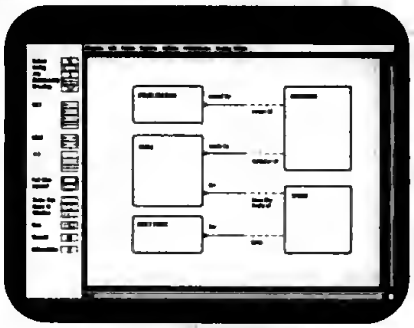
"It is the classic case of a market in transition. It's no surprise that minicomputer vendors are in a squeeze play with PC vendors today," said Cheryl Currid, president of Currid & Co., a consultancy in Austin, Texas.

Currid said minicomputer vendors still have a considerable edge over PC vendors in systems support.

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[redacted]

NEC Technologies, Inc. has announced RISCstation 2000, a RISC-based workstation that runs on Microsoft Corp.'s Windows NT.

According to the Boxboro, Mass., company, the RISCstation 2000 provides symmetrical multiprocessing and multithreading capabilities for 32-bit applications.

The product includes a NEC MultiSpin 3XI CD-ROM reader and the Windows NT operating system. The workstation operates at 150 MHz with 32K bytes of internal cache and 512K bytes of external cache on a CPU module.

Prices range from $6,000 to $10,000, depending on configuration.

▶ *NEC Technologies*
(508) 264-8000

Atto Technology, Inc. has announced ExpressStripe 3.0, redundant arrays of inexpensive disks Level 0 software.

According to the Amherst, N.Y., company, ExpressStripe 3.0 reads and writes data for Macintoshes over several drives at once. It was designed for use with any of Atto's SiliconExpress accelerator cards.

Users can strip and mount drives in one step and customize striping configurations for individual application needs. Other features include new algorithms, scatter/gather block management and striping on a partition basis.

ExpressStrip 3.0 costs $395.

▶ *Atto Technology*
(716) 691-1999

Integrix, Inc. has announced the SWS5/85, a workstation compatible with Sun Microsystems, Inc.'s SPARCstation5.

According to the Newbury Park, Calif., firm, the workstation has a SPARC II-based processor and is upgradable to SPARCstation20 compatibility.

The product comes with three 32-bit Sbus expansion slots, a 64-bit graphics bus and up to 256M bytes of internal RAM.

The SWS5/85 costs $3,495.

▶ *Integrix*
(805) 375-1055

Dimensional Insight, Inc. has announced that CrossTarget, its family of client/server data analysis tools, supports seamless movement of data from legacy systems and relational databases to software suites.

According to the Burlington, Mass., company, CrossTarget transforms raw data into a model that users can navigate via Diver, the graphical user interface.

Features added to the interface include a Group function that lets users treat multiple dimensions as if they were one, a MultiTab function that instantly adds columns to a cross-tabular display and a tool bar with 18 icons to access the most commonly used features.

CrossTarget costs $1,000 per workstation for a standard configuration.

▶ *Dimensional Insight*
(617) 229-9111

The ForeFront Group, Inc. has announced Virtual Notebook System (VNS) 4.0, collaboration and knowledge management software.

According to the Houston company, VNS 4.0 provides cross-platform collaborative work by providing features found in Notes, shared whiteboards and databases.

The product uses a notebook metaphor to unite disparate pieces of multimedia information and histories of collaborative projects.

VNS 4.0 Windows and Macintosh clients cost $595 each. X Window System clients cost $795, and a VNS server license costs $6,000.

▶ *The ForeFront Group*
(713) 961-1101

Dolphin Interconnect Solutions, Inc. has announced the Sbus-Scalable Coherent Interface (SCI) adapter card, for use in workstation clustering applications.

According to the Santa Clara, Calif., company, the Sbus-SCI adapter card was designed for use in distributed parallel processing, imaging, scientific engineering visualization, simulation and graphics.

The card can extend shared memory between computers and runs two 1G bit/sec. links.

The Sbus-SCI adapter card costs $2,450.

▶ *Dolphin Interconnect Solutions*
(408) 562-5736

Claris Corp. has announced FileMaker Pro Server for Power Macintosh and FileMaker Pro Solutions Development Kit.

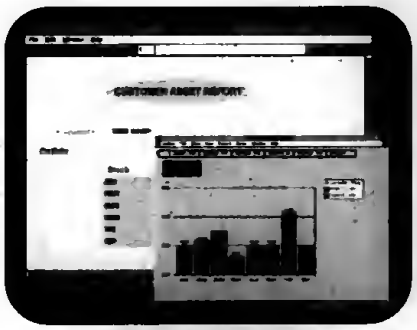
According to the Santa Clara, Calif., company, FileMaker Pro Server for Power Macintosh provides central database file access for up to 100 concurrent Macintosh and Windows FileMaker Pro users over an AppleTalk network. The product lets numerous database operations take place simultaneously.

The FileMaker Pro Solutions Development Kit lets users run customized FileMaker Pro Macintosh and Windows applications without having to purchase the FileMaker Pro software.

FileMaker Pro Server for Power Macintosh costs $1,499. The FileMaker Pro Solutions Development Kit costs $499.

▶ *Claris*
(408) 987-7000

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WELLFLEET

ISDN access barriers fall, but hurdles remain on learning curve

By Steve Moore

When Integrated Services Digital Network (ISDN) services took much longer than expected to become available in the U.S., jokesters had a field day thinking up new meanings for the acronym. "It Still Does Nothing" was a favorite.

That is no longer true. Not only are some pioneering shops using ISDN, but many also report substantial benefits over the traditional analog, modem-connected systems of the past. Among ISDN's advantages are faster response times, multiple channels and the potential to support the intelligent processing of incoming voice and data calls, according to early implementors.

"ISDN lets us promise quicker turnaround and shipping dates," said Hank Hensel, network manager at Publishers Printing Co. in Shepherdsville, Ky. Modems proved slow and troublesome, so until recently the company depended on overnight couriers to gather disks containing large graphics files from customer sites nationwide, Hensel said.

"With ISDN, I expect [electronic file transfers] to just mushroom to where I'll have most of our customers sending us data, with the rest of it coming in overnight bags," he said.

ISDN basic rate	Analog line with modem
Digital devices connect quickly	Modem "handshake" slows response
Two data channels support parallel tasks	Single channel
128K bit/sec. bandwidth for data	Maximum 28.8K bit/sec. (V.34)

Channel carrier

A basic rate ISDN circuit, which supports a remote office, provides two 64K-bit digital data channels that are fully available for data. Signaling traffic for ISDN call setup and management is carried on a 16K-bit channel.

Today, ISDN service can be obtained on "about 67% of all telephone lines in U.S. metropolitan areas," said Mike Gawdun, an advanced technology consultant at the United States Automobile Association in San Antonio. A spokesman for Bellcore, the organization that does research and development for the Bell operating companies, said the number will soon reach 80%. He also noted that there are approximately 200,000 basic rate ISDN lines in service nationwide today.

"Thus far, it has been a chicken-and-egg problem," said Ken Lowrance, a telecommunications manager at Monsanto Co. in St. Louis. "ISDN hasn't been available everywhere, so people are not ordering it. But since not enough people are ordering it, some of the telcos are reluctant to implement it."

Most of the regional Bell operating companies already have ISDN available throughout their regions except for "some isolated spots, like the upper peninsula of Michigan, where an ISDN upgrade is not economically justified yet," said Karen Fitzgerald, director of ISDN product management at Bellcore in Piscataway, N.J.

Back to school

As with most technology that is both new and complex, ISDN has a learning curve that even the telephone companies are struggling with.

"Pacific Bell says they will supply ISDN to everybody, but right now some of their technicians have no idea what to do" to get ISDN lines properly configured, said Kirk Fjeldheim, MIS director at Network General Corp. in Menlo Park, Calif. "They sound like they're reading from a manual and looking things up as they go."

"We've had more than a 300% year-to-year increase in the installed base of single-line ISDN," said Steve Green, Pacific Bell's manager of data products. While that demand temporarily skyrocketed beyond the technical staff available, "we have a lot of highly qualified technicians in the field, and we have a core process re-engineering effort under way now to increase the technical capabilities of all our technicians statewide," he noted.

Users are struggling up the curve too. Most shops "wouldn't know how to manage an ISDN network if it came out and bit them," Gawdun

ISDN, *page 70*

Trade group succeeds with bulletin board package

By Gary H. Anthes
WASHINGTON

The first systems seeds sown by the American Society of Landscape Architects (ASLA) fell on barren soil, but now the association's on-line member services are beginning to bear fruit.

Several years ago, ASLA spent $250,000 — much of it for outside consultants — to put up a custom-designed bulletin board system for its 10,500 members. Priced at $35 per month, the text-based system was a flop, with fewer than 250 users the first year.

"We spent a ton of money, and it failed miserably," said Peter Kirsch, director of marketing at ASLA. "It was hard to use, hard to find information, hard to find out even what was available. Our members were paying every month just to learn how to use the system."

Second time around

Now, using a commercial bulletin board package, ASLA's DesigNet service has more than 1,700 users and will turn a profit of $38,000 on revenue of $43,000 this year, its first full year of operation.

Driven by colorful graphics, the new system is easy to use, and perhaps most important, is free to members.

The economics are not bad from ASLA's point of view, either. Out-of-pocket operating costs are low because DesigNet is maintained by existing staff, Kirsch said. "Once you are up and running, there are no costs — just a little staff time," he said.

The $38,000 profit does not reflect a savings in print costs. Instead of printing the member directory annually for $60,000, ASLA put it on-line and prints a stripped down version every other year for $25,000. ASLA's annual budget is $6 million.



Some revenue for the service comes from member subscriptions to the "Commerce Business Daily," which ASLA buys for $50 and sells for $199 per year. ASLA also collects fees from several "partners," other associations and companies that share space on the network.

For example, the National Concrete Masonry Association (NCMA) has set up three on-line conference areas for its members and would-be buyers of members' products and services. Users can access a membership directory, a list of association services, concrete product lists and publication lists, which can be ordered via electronic mail.

"It's a good way for us to market our products to landscape architects," said Julia Mueser, manager of landscape products at NCMA. "One of the biggest benefits is having our name on the system as a partner. I see it as a marketing tool and as a way of making our materials available to designers a lot more easily."

When logged on to DesigNet, it is possible to see who else is using the system. "In a demonstration to our members, one of our manufacturers knew one of the guys who was on-line — a landscape architect he had done work with," Mueser said. "He was sold instantly. He said, 'Oh, wow, I can get on-line and talk to him. He's going to see our marketing, our literature on the system.'"

"Obviously the revenue is nice, but the best thing is that we've been able to generate strategic alliances with these partners," Kirsch said. "And it allows us to show we are technologically advanced. The bottom line is public relations."

Henry Chamberlain, a vice president at the Building Owners and Managers Association, said the association uses the system now for electronic mail and document transfer but will add "issues forums," a member bulletin board and on-line membership databases.

Recruitment drive

Despite the financial success of the on-line service, Kirsch said only 15% to 20% of ASLA members are active users, even though a survey showed 65% have PCs and modems. He said he hopes to boost that considerably through marketing and educational programs, particularly at the state chapter level.

DesigNet uses the Wildcat bulletin board software from Mustang Software, Inc. in Bakersfield, Calif. For communications, members download Ripterm, freeware from TeleGrafix Communications in Huntington Beach, Calif. DesigNet has 24 incoming telephone lines and runs on a pair of Intel Corp. 1486-based PCs located at the association's national headquarters in Washington.

Users want information over entertainment

A semiregular column with items of interest and amusement from the Internet.

Build it and they will come? Not necessarily. According to a recent survey, consumers are far more interested in the infobahn as a way to receive news and information than as a place for interactive shopping.

The 1,000-person telephone poll conducted by Lou Harris and Associates for the nonprofit journal *Privacy & American Business* found that almost 75% of respondents would like a customized news report, and 50% would like the ability to communicate with others. But only 40% were interested in movies on demand, and only 30% said they wanted interactive shopping.

*****

Nevertheless, if their marketing expenditures are any indication, business is clearly banking on an interactive channel to tap the pockets of consumers.

Spending allocations for interactive media advertising have more than doubled in the past three years, according to OmniTech Consulting Group, Inc. in Chicago. OmniTech found that traditional advertising as a portion of marketing budgets declined 4.1% during the past three years, while virtually all respondents predicted an increase in interactive advertising — including on-line services, infomercials, CD-ROM catalogs, CD-ROMs, in-store kiosks and the like. Nearly 60% said they already include interactive media in their marketing plans; nearly half cited on-line services as the interactive advertising medium of choice. OmniTech conducted its telephone survey in August for *Advertising Age* magazine.



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But our bet is that until multimedia becomes widely available, shopping on the internet will continue to be, at best, a niche application. Multimedia — especially full-motion color video — requires substantial bandwidth on the desktop. Enter Integrated Services Digital Network (ISDN), the digital public network technology that is finally, it seems, coming into its own. This month, ISDN-tek in San Gregorio, Calif., announced an ISDN card for PCs that is specifically aimed at 'oot cruisers. The CyberSpace internet Card works with TCP/IP software like Mosaic. The card's list price is $395, and it comes with interface drivers for any WinISDN-compatible TCP/IP software.

In a good example of the hardware/software service provider alliance that is becoming common in the internet arena, the Cyberspace Internet Card is also being resold by PSI Software, which offers a $29-per-month Internet access card. PSI also sells NetManage Internet Chameleon 4.03, a WinISDN-compatible browser.

*****

Two recently introduced public domain offerings include:

"Federal Government Information on the Internet," Release 8. It is a compendium of all kinds of data from the federal government and is available via anonymous file transfor protocol from the University of Nevada at ftp://nevada.edu/pub/liaison/govrmnt.zip. For more information, send mail to magoo@nevada.edu.

*****

Harvard University's Kennedy School of Government has announced publication of Version 4.0 of the *Information Infrastructure Sourcebook*, edited by Brian Kahin.

The 1,700-page, three-volume guide contains information on efforts to develop policy for a national information infrastructure. It contains historical documents, vision statements, position papers, program descriptions, reports and pending legislation.

It is available on paper for $85 from Harvard's Office for Information Services (E-mail: arainey@basct0.harvard.edu) or free via Gopher at gophor.harvard.edu.

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Please keep us posted with your views, news and questions about items published in this space. Contact us electronically at ellis@cw.com.

— Ellis Booker, Gary H. Anthes and Mitch Betts

Test drive

Data capture tools separate Mosaic packages

By Peter Kent

The National Center for Supercomputing Applications (NCSA) is licensing Mosaic, the most well-known Internet access interface, to private businesses that modify it and sell it. Two important vendors in the Mosaic business are Spyglass, Inc. and Spry, Inc.



Spyglass in Savoy, Ill., offers Enhanced NCSA Mosaic. Users will soon see it bundled with various computers and software packages from the likes of IBM, NEC Corp. and Digital Equipment Corp.

Seattle-based Spry includes the product with its Internet suite of software and sells it to the general public as Internet in a Box and to the corporate world as the Air Series. The browser inside is called Air Mosaic.

Like the most recent version of NCSA's Mosaic, Enhanced NCSA Mosaic is a 32-bit program. That means it will not run on Microsoft Corp.'s Windows 3.1 or Windows for Workgroups unless the Win32 software from Microsoft is installed. Spyglass has integrated Win32 installation into Enhanced Mosaic's setup program, which means users who need Win32 will get it automatically.

Enhanced NCSA Mosaic looks much like Mosaic itself, but there are some differences. Perhaps the most important is that Enhanced NCSA Mosaic lets the user copy documents to a clipboard or save them to a file. Mosaic currently cannot copy, and it can save the document only in its raw HyperText Markup Language (HTML) format.

Another handy feature: Click on a link, read the linked document, then return to the previous documeot and the link changes color. This helps users see where they have been, which is oot always easy in hypertext. And Enhanced NCSA Mosaic even allows multiple Web sessions — users can open several document windows within the main window and run a different session in each.

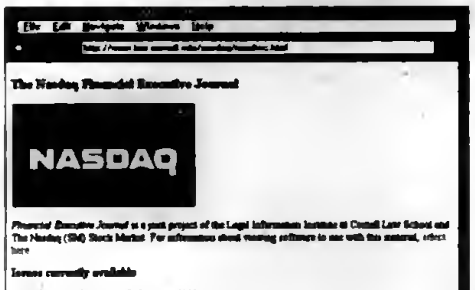
The bad news

But not everything is an improvement. Many links do not point to text documents but to files that users may want to download. These include pictures, sounds, software utilities and so on.

In the NCSA's original Mosaic, the user simply selected the Load to Disk command, then clicked on the link and the download began. In Enhanced NCSA Mosaic, this command has been removed; the user has to remember to press "Ctrl" while he double-clicks on the link.

There are lots of other little changes, some good, some bad, some subjective. Mosaic's tool bar is gone, the mouse pointer doesn't change into a hand when pointed at links, and users cannot create their own menus as they can with Mosaic.

There is a simplified Hotlist system — a sort of bookmark system — in which tbo titles and addresses of useful documents can be saved. Users can even save a hot list or history list (a list of all the documents viewed in the current session) as an HTML file, then open tho file in the browser and use it to jump around on the internet World-Wide Web — each line from the hot list or history list appears in the document as a link.



Spyglass' Enhanced NCSA Mosaic *lets users copy to a clipboard and save to a file, functions Mosaic could not do*

Spyglass now has the sole rights to future licensing agreements for NCSA Mosaic. Any company that wants to create its own Web browser based on Mosaic must negotiate with Spyglass and will get the source code for the Enhanced version of Mosaic, not the original version.

Spry's Air Mosaic is sold to the corporate world as part of its Air Series of TCP/IP programs.

Once installed, Air Mosaic looks very similar to Mosaic, with a few important changes. It has a customizable tool bar — users can get rid of the pictures and just use words. And it has a simplified configuration system. Instead of putting lots of options on a menu and requiring users to edit the .INI file to change others, Air Mosaic provides a single configuration dialog box.

But Air Mosaic has a big weakness: Documents cannot be copied to a clipboard, at least not without taking the HTML codes with them. Nor can the document be saved, at least in the beta version.

It does have a very nice hierarchical hot list system, though. This lets users create folders to contain hot list items and even lets them create a menn from a hot list. And users who have been using real Mosaic for a while will like the feature that imports Mosaic menus, converting them to hot lists.

Kent is the author of *The Complete Idiot's Guide to the Internet* (Alpha Books). His next Internet book, *The Complete Idiot's Guide to the World-Wide Web*, is due out in February.

Wellfleet's low-end routers let users scale up networks

By Stephen P. Klett Jr.

Wellfleet Communications, Inc. has announced a stackable router platform designed to allow customers to start small and grow as their needs change.

Typically, users must decide if they will oeed one, two or more wide-area connections wheo buying a router for a remote or regional office, for example. They also have to figure out which kinds of interfaces they may need such as Integrated Services Digital Network (ISDN) and Asynchronous Transfer Mode (ATM). The wroog choice can mean repiacing a $20,000 piece of equipment after only a year.

Wellfleet's Access Stack Node (ASN) router allows users to buy additional units and interfaces as their needs grow. For instance, ASN can connect small, remote sites to a corporate oetwork. Later, users can scale the box to accommodate larger departments or regional sites.

Stackable specs

Wellfleet's Access Stack Node router allows users to start small and grow gradually

Target site	Network connections	Price
Large remote office	2 Ethernet 2 Synchronous Data Link Control 2 WAN (1 router)	$13,100
Departmental access	6 Ethernet 1 FDDI (1 router)	$22,000
Regional office	2 Ethernet 2 Token Ring 8 WAN (2 routers)	$27,400
Remote office/ division site	6 Ethernet 4 Token Ring 2 WAN (2 routers)	$30,500
Carrier LAN service access	18 WAN (3 routers)	$36,750

"The problem with current remote routers today is that they have a fixed configuration. And once your needs outgrow its capabilities — guess what — it's an expeosive paperweight," said Michael Rothman, a director at Meta Group, Inc., a consultancy in Reston, Va. ASN "is a good concept that gives users the warm fuzzies that they can ramp up if needed."

Competitive pressures

ASN is critical to Wellfleet's efforts to compete with the recent aggressive thrust into the low-end of the router market by rival Cisco Systems, Inc., Rothman added [CW, Sept. 19].

Up to four ASNs supporting as many as 24 network interfaces can he included in a single stack. Interfaces are available for Ethernet, Token Ring, ISDN Basic Rate Interface and Fiber Distributed Data Interface networks. Interfaces for ATM and ISDN Primary Rate Interface networks are expected to ship in the first half of next year, Wellfleet said.

ASN is available now at prices starting at $4,000.

Beta users said ASN was a good option for sites where Wellfleet's Link Node (LN) departmental router was too much muscle or sites where Wellfleet's low-end Access Node was too little.



"The LN in an identical situation comes at a 50% premium, and it's a mature product. It's time for Wellfleet to move into the lower end," said Rob Drye, a network engineer at Dartmouth Medical Center in Lebanon, N.H. Drye said his organization plans to ose ASN as a replacement for LN at some sites.

"ASN's main benefit is incremental growth without needing to figure out what size chassis you need up front," said Gregg Cooper, data communications manager at Watchtower, the Jehovah's Witnesses headquarters.

A four-unit ASN stack, which has been in production for a mooth, is temporarily being used in place of a Wellfleet Concentrator Node router in Watchtower's central headquarters in New York. "We know the central site's not an ideal place for it, but we figured if it could handle things there, it could work anywhere — and so far it has," he said.





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RAM Mobile Data makes slow, steady progress

Seiko reveals plans to build global wireless net

By Michael Fitzgerald

The wireless world continues to struggle along, but it has won a few rounds recently. For instance, RAM Mobile Data gained five new customers, including a potential 2,000-user deal with Unisys Corp.

Unisys will use RAM Mobile Data's wireless data network, as well as software, modems and PCs from the company, to give wireless access to its 2,000-plus U.S. field service technicians.

Unisys is moving to wireless after rejecting the technology in favor of wirelines several years ago, according to Ted Bullock, vice president of operations at the company's Customer Services Worldwide Division. In part, the move came as Unisys was upgrading its terminal technology to Panasonic Personal Computer Co. V2t notebooks with built-in 3½-in. CD-ROM drives.

One reason Unisys is going wireless now is because the whole PC service industry has changed, Bullock said. When Unisys goes to a customer site, it will often replace an entire unit instead of swapping out a part, as used to be the case, he said. This has created the potential for more rapid turnaround on service calls.



Merchants Home Delivery's Michael Stark: *'... the more timely information is, the more time there is for us to react'*

Currently, 300 Unisys technicians are using RAM Mobile Data, with 700 slated to receive it next year and the bulk in 1996. Longer term, Unisys may leverage RAM Mobile Data's Mobitex network, which uses the same technology in the U.S. and Europe, to outfit its European service group with RAM Mobile Data, Bullock said.

> If all goes well with Kodak's 500 person pilot field service application 4,400 service people will get wireless capabilities

Going mobile

Other major corporations that recently announced they were using RAM Mobile Data include Eastman Kodak Co., Merchants Home Delivery Service, Inc., the sheriff's office in New York and the fire department in Overland Park, Kan.

Kodak is running a 500-person pilot for a field service application. If the pilot goes well, all 4,400 field service personnel will gain wireless capabilities.

"We feel radio frequency wireless has now hit a stage where it's affordable," said Frank DiOrio, product service manager for customer service at the Rochester, N.Y., company.

Merchants Home Delivery, the nation's largest retail home delivery service, is using RAM Mobile Data in 75 of its delivery trucks. One of its customers, Tops Appliance City, a large Edison, N.J., retailer, asked for a way to use wireless technology so it could have real-time contact with delivery drivers. Merchants Home Delivery tested RAM Mobile Data running on PocketPad handheld computers from Fujitsu Personal Systems, Inc., according to Michael Stark, vice president of administration at Merchants Home Delivery in Oxnard, Calif.

"It makes a lot of sense [in our niche]. The more timely information is, the more time there is for us to react" to customer requests, Stark said. He added that once a software update stabilizes, Merchants Home Delivery will make this service available to other customers. Some 600 to 800 drivers could eventually get wireless terminals installed in their trucks.

The New York City Sheriff's Office will use RAM Mobile Data to authorize credit-card transactions. This will allow citizens with more than $23 in overdue parking tickets to pay on the spot and avoid having their cars impounded.

Despite these new customers, RAM Mobile Data's installed base remains under 15,000 users.

Global link

Meanwhile, one vendor is planning a wireless network that will send messages anywhere in the world. Seiko Corp. announced a new subsidiary, Seiko Communications of America, Inc., that will use FM radio frequency to send messages and other information globally. Seiko said it will also create products that let individuals receive messages on wristwatches, car stereos and other consumer devices.

The network, to be called Actrive, already has a receiver: the MessageWatch, a $79.95 watch that can receive small messages. The basic service fee is $6.95 per month.

Seiko's network is being tested in Seattle as part of the U.S. Department of Transportation's Intelligent Vehicle Highway System.

Analysts found Seiko's network intriguing but pointed out that it is just another standard in a market with a tremendous and growing number of conflicting approaches to wireless networking.

"The last thing we need is another standard. What we really need is an agreement among standards, plus a way to interconnect," said Iain Gillot, an analyst at Link Resources Corp. in Framingham, Mass.

[redacted]

Information Presentation Technologies, Inc. has announced LessTalk, an Apple Computer, Inc. AppleTalk system extension that reduces chatter on a network of Macintoshes.

According to the San Luis Obispo, Calif., company, LessTalk lets users control the polling interval at which a Macintosh requests information about mounted volumes.

Because polling is done only by the Macintosh client, LessTalk can be used on any AppleTalk Filing Protocol-compliant AppleShare server. Features include drag-and-drop installation, a configuration utility and network management.

LessTalk costs $39.

▶ *Information Presentation Technologies*
(805) 541-3000

Vinca Corp. has announced Remote StandbyServer.

According to the Orem, Utah, firm, Remote StandbyServer is a fault-tolerant server that connects a second remote server directly to the main file server.

The product provides data availability in the event of a disaster and lets branch-office data be recentralized for backup and software distribution.

Remote StandbyServer costs $6,995.

▶ *Vinca*
(801) 223-3100

Infonet Software Solutions, Inc. has announced Management Control Center, message management software.

According to the Burnaby, British Columbia, company, Management Control Center lets administrators monitor, configure and troubleshoot electronic-mail systems across a wide-area network from a central site.

The product automatically polls message servers for traffic status and triggers alarms when a message fails to meet system compatibility requirements.

The cost is $10,000 to $30,000, depending on the workstation configuration.

▶ *Infonet Software Solutions*
(604) 436-2922

Ipswitch, Inc. has announced IMail 1.0, internet electronic-mail software for Windows.

According to the Wakefield, Mass., company, IMail is a complete TCP/IP E-mail system featuring clients and servers for popular Internet protocols, along with multimedia support.

Features include filtering, searching, file import and export, address books and multiple mail boxes.

IMail 1.0 costs $55.

▶ *Ipswitch*
(617) 246-1150

Intrak, Inc. has announced ServerTrak for Windows, a Novell, Inc. NetWare server support tool.

According to the San Diego firm, ServerTrak for Windows monitors more than 45 vital performance statistics and ratios, records information for up to eight hours and displays information in full-color graphics.

The product maintains a real-time status of all statistics and the history of the information for the duration of a lost server connection.

Prices range from $249 to $999, depending on the number of servers.

▶ *Intrak*
(619) 695-1900

ISDN

CONTINUED FROM PAGE 65

said. The best way for users to bite back is to become active in ISDN user groups in their geographical areas, he added.

Surmounting the learning curve is well worth the effort, observers said. Those who get ISDN up and working have more precise control than they do in modem-connected sites, said Bob Larribeau, president of Larribeau Associates, a San Francisco consultancy.

For example, he said, a remote site router or bridge that supports Simple Network Management Protocol (SNMP) will respond more quickly in an ISDN environment thanks to ISDN's shorter call setup times. Delays in connecting modems, and the uncertainty with analog lines in general, are all but eliminated, Larribeau added.

ISDN will also allow corporations to link their far-flung LANs via low-cost, all-digital circuits. ISDN will allow — even entice — information systems managers to provide more networked applications than they could using today's communications infrastructure. But at the same time, this will create a substantial increase in data traffic between central and remote sites, according to Steve Thomas, director of product marketing at Ascend Communications, Inc. in Alameda, Calif.

Good match

ISDN works best for remote sites that do not need to be constantly connected to a central site, said Russ McGuire, manager of product concepts at Wiltel in Tulsa, Okla. "ISDN may be good for supporting relatively isolated LANs that generate SNMP polls every 15 minutes or so," he said. ISDN is especially useful for remote sites connected to a central place for less than a minute, he said.

Some early adopters are using ISDN for teleconferencing applications that combine video with voice or data, but few have yet explored ISDN's ability to support new network management capabilities.

In the future, ISDN's intelligent call processing techniques could be used in data network management applications. For example, alarms and alerts might be automatically forwarded to the appropriate technical support staff member's management console, office telephone, desktop computer, portable computer or cellular phone.



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Paving the road to storage management

Companies tangle with automation, reliability and capacity

By Mary Brandel

Michael Kolak does not back up his data once; he backs it up twice.

All the distributed data at Oak Brook, Ill.-based McDonald's Corp. — 13G bytes on 20 home office servers and 200G bytes on 45 remote servers — is collected by the mainframe using Harbor from New Era Software Systems, Inc.

But what if a remote server crashed and Kolak lost the entire file system?

"It would take me forever across the WAN to recover the machines from the mainframe," he said. For that reason, he also does weekly backups locally using 8mm tape and Unix backup utilities.

When companies try to manage their distributed data — whether they centralize storage or choose a more patchwork route — they all discover the same thing: They will have to pave the road to distributed storage management at the same time they are driving to it.

"What I have works and works pretty darn good," said Kolak, group leader of the systems management infrastructure at McDonald's. But no matter how you cut it, he said, recovery on the network is lengthy, labor-intensive and error-prone.

"If there's anything that would make a big impact, it would be a more automated, robust disaster-recovery system," he said. "The stand-alone restores really common in mainframes just don't exist on Unix servers."

But plenty of people are resisting the centralization urge. These sites are building departmental solutions with tape autoloaders, storage servers and software packages from PC LAN and Unix players, including Cheyenne Systems, Inc., Legato Corp., Palindrome, Inc. and Epoch Systems, Inc.

Fixing up systems

The former niche vendors are feverishly working to make their systems less labor-intensive, more manageable and capable of working in multiple environments.

Still, the distributed route is not for the faint-hearted.

Take Mike Goebel, senior communications analyst at a major food manufacturer in Minneapolis. Goebel is currently tangling with 30 server-attached tape units running Arcada Systems, Inc.'s Backup Exec. Every night those 30 tape units must fully back up 62G bytes of data on 60 or so Intel Corp. 1486-based servers.

Even worse, the department has standardized on Microsoft Corp.'s Windows NT Advanced Server — perhaps the least supported environment as far as backup is concerned.

But Goebel does have plans. He wants to dump the plethora of tape units by creating another dedicated backup network with four or so servers that would hang off the main LAN. Every six hours or so, the LAN file servers would send incremental backups to the magnetic disks of the "central servers" on the duplicate network. Then, each night the central servers would fully back up to a server with a 12-cartridge tape autoloader attached.

This setup would take the squeeze off the ever-compressed backup window, cut down on labor, remove the backup burden from the LAN — increasing performance — and increase reliability (see story below).

Restores would also be on-line. "The desktop support analyst can just take backup directly off the disk," Goebel said.

With disk prices dropping to 50 cents per gigabyte, Goebel's strategy — sometimes called hot backup — will become an increasingly popular trend, analysts said.

Hot backup software is emerging. IBM's ADSM/6000 — which backs up data to an AIX server — is a good example, said Michael Peterson, an analyst at Peripheral Strategies, Inc. in Santa Barbara, Calif.

Capacity concerns

But Goebel has another problem. By next June, he will have begun consolidating his 60 servers down to four or so high-end Sequent Computer Systems, Inc.-based servers. At that point, data capacity will triple and "going to the disk idea isn't as cost-effective anymore," he said. Goebel said he hopes to find tape libraries that are as automated as in the Unix environment.

Another option would be to use a "storage server." These systems, shipping next month from Maxoptics Corp. and also sold by Network Appliance Corp., Fujitsu America, Inc. and others, integrate magnetic and optical discs in one box. Some, including Fujitsu, allow tape libraries to be attached, and some perform hierarchical storage management functions as well.

The sole purpose of the storage server is to "off-load backup tasks from the file or application server," said Bill Frank, an analyst at Augur Visions, Inc. in Los Altos, Calif. In addition, they are inexpensive, fast and reliable, he said.

Not so remote problems

Yet another problem looms for sites that choose the distributed route: Backing up remote sites today is a discouragingly labor-intensive task.

At Orlando Health Care in Florida, 50 NT servers store 500M bytes of data in remote sites throughout the region. David Greenberg, director of new systems development, said he does not want to pay a network technician's salary to back up data at each of those sites. "I want a nice way of centrally managing what gets backed up, when it gets backed up and whether it gets backed up," he said.

He has tried Arcada's Storage Exec — the only NT backup software that offers a centralized management console. But "they don't have it together yet," he said. For one thing, if the management console drops the connection to the remote server, the remote server would eject the tape. "You'd have to have a human go back and pop it back in," he said.

Earlier this month, Hewlett-Packard Co. introduced a six-cartridge autoloader bundled with software in-

Storage management, *page 75*

closer look
Storage management

The costs

If you have 50 to 100 workstations on a Unix network, you can count on spending $6,959 per gigabyte per year to manage your disk storage, according to Peripheral Strategies. For PC LANs, count on $3,730 per gigabyte. The costs do not decrease much for larger sites. Unix storage management costs $6,830 per gigabyte per year, and PC LAN costs $2,290 per gigabyte.

Automatic savings

The following costs for unautomated networks could be reduced by $14,000 for Unix systems and $60,000 for PC LANs by adding automated backup and hierarchical management software

Storage function	Unix*	PC LAN*
Backup and restore	$304,987	$22,155
Archiving	$189,299	$4,696
New disk drives	$127,060	$81,560
Off-line drives and media	$5,236	$20,856
Total	$626,582	$129,267

*Typ-workstation site

Source: Peripheral Strategies, Inc., Santa Barbara, Calif.

Seeking reliability

Reliability is the first thing you would expect from a backup system. Unfortunately, it is sorely lacking in LAN environments.

Two to three failures per week is typical, according to Michael Peterson, an analyst at Peripheral Strategies.

"Tapes bang; they need cleaning. I don't know how many hundreds of production hours we've lost because of failures," said Mike Goebel, senior communications analyst at a large food manufacturer in Minneapolis.

The most often-cited reason for failure is open user files, Peterson said. No backup software today can back up a file if it is in use. Human failures abound as well.

But tape drives themselves have traditionally taken a lot of heat — 8mm technology from Exabyte Corp. in particular.

With any tape, "the head contacts the media, so the drives" wear out, explained Bill Frank, an analyst at Augur Visions in Los Altos, Calif. Dirt can also destroy the ability to read data.

Quantum Corp. is taking advantage of the situation with its Digital Linear Tape, or DLT, acquired from Digital Equipment Corp.

"It's helical-scan technology where the head doesn't touch the tape," said Michael Kolak, group leader of the systems management infrastructure at McDonald's, which is considering DLT. "It's also higher capacity and lasts a lot longer." It is also premium priced and a nonstandard form factor.

Exabyte has a counterattack planned: Mammoth — a rearchitected 8mm tape drive — will ship next August, with a higher transfer rate (3M byte/sec.), higher capacity (20G bytes) and better reliability (200,000-hour mean time between failure).

At the same time, Exabyte denied any problems with its drives. It conceded, however, that its older 8200 drives — used by two-thirds of its installed base but no longer marketed — are less reliable than its current 8500 and 8505 drives.

— Mary Brandel

Users urge HP to beef up profile on database prods

By Mark Halper

Minnesota Mining & Manufacturing Co. (3M), a large Hewlett-Packard Co. HP 3000 shop slowly migrating to open systems, is frustrated with HP for not aggressively marketing its database products.

After all, if HP did raise the profile of its Image/SQL and Allbase/SQL databases, users would be reassured that HP plans to continually evolve and update those products, according to John Schmid, lead database analyst at 3M.

User needs

Schmid's frustration represents the feelings of a number of HP 3000 and HP 9000 users who believe that a more active marketing campaign would encourage development among third-party tool and application providers.

"It would behoove HP to market" Image/SQL, noted Chris Werle, a systems analyst at Lincolnshire, Ill.-based Boots Pharmaceuticals, Inc. A higher profile marketing position might generate development activity that would improve front-end access to Image/SQL from PCs, he said.

"Now you have to either add another layer or extract the data yourself," said Werle, who uses Image/SQL on an HP 3000 to support all of Boots' critical operations. He also uses Oracle Corp.'s Oracle 7 on an HP 9000 for querying sales and marketing information.

Quick response

When Schmid raised the issue to a panel of HP executives at last month's Interex '94 HP user conference in Denver, Rich Sevcik, HP's systems and server general manager, was ready with a candid answer.

"If HP decided to become an aggressive database company, I imagine it would run into enormous trouble with our database partners," he said, referring to the likes of Oracle, Sybase, Inc. and Informix Software, Inc.

Sevcik further explained that HP "needs to walk a fine line" in order not to upset its premier partner status with those companies, whose products help drive sales of HP minicomputers, especially HP 9000 Unix-based systems.

For some users, the marketing question also draws attention to HP's refusal so far to offer Image/SQL on Unix platforms, including its own HP/UX-based HP 9000. HP is considering such a move [CW, Nov. 1, 1993].

Users such as Don Harrington, a systems analyst at Boeing Co., noted that the HP 3000, because it retains a hierarchical structure accessible through a SQL front end, is a faster database than its fully relational competitors.

"I would sure like to see Image spread around the Unix world," Harrington said. "I just don't think relational is the be-all and end-all."

Denys Beauchemin, a programmer at Houston-based database tool and backup vendor Hicomp America, Inc., pointed out that moving Image/SQL into a Unix environment might cross Sevcik's fine line of not upsetting database partners such as Oracle.

By comparison

HP rival Digital Equipment Corp. recently exited the database business when it sold its relational database line to Oracle Corp.

One analyst who asked not to be identified noted that a more aggressive database push might help HP backers in information systems shops win internal political battles with proponents of competing third-party products.

Beauchemin noted that a higher profile would help reassure HP 3000 users that HP is committed to them and their MPE/IX operating system for the long haul.

Two sides

Peter Burris, director of worldwide systems and services research at Framingham, Mass.-based International Data Corp., summed up the equation.

"Some HP customers might get more productivity, more performance, but on the other hand, they might have more to lose if some of the independent software vendors determined that HP was emerging as a key competitor. If you're an HP user, overall your best interest is to see HP's relationships with ISVs [be as good] as it possibly can."

Harrington noted another reason why a more pervasive Image/SQL community would benefit him and other HP users.

"It would broaden my employment opportunities," he said.

Craig Stedman

Is Iceberg in trouble?



Icebergs haven't attracted this much attention since 1912.

In the last month or so, Wall Street has developed an almost obsessive interest in Storage Technology Corp.'s Iceberg mainframe disk array. StorageTek is in play, as the touts put it, and short sellers are spreading nasty rumors about technical problems with Iceberg in hopes of sending the company's stock price down to the equivalent of the 12,500-foot depths where the Titanic bottomed out after meeting some truly water-cooled big iron.

StorageTek promptly described the rumors as "completely false" and even "malodorous." The Louisville, Colo., vendor acknowledged that Iceberg has encountered some technical "issues," but it said the bugs have all been swat-able, so to speak. The rollout of the array continues to accelerate, it added.

So where does the truth lie? Probably somewhere in the middle. No users or analysts I talked to have found any concrete evidence that Iceberg is afflicted with major technical difficulties. On the other hand, sales are not meeting the sunny forecast that StorageTek made last spring, and some are concerned that it did little with the time-to-market lead that Iceberg held until IBM's late September shipment of its Ramac array.

StorageTek, which is due to report its third-quarter financial results this week, said about 65 icebergs were sold from July to September — only half the amount analysts were told to expect at the start of the quarter. A little more than 90 have been sold altogether, at an average price that SoundView Financial Group in Stamford, Conn., puts in the $900,000 range. At that rate, it would seem pretty tough sledding for Iceberg to reach the $350 million revenue total that StorageTek predicted for this year.

Of course, that may not matter much as you get farther away from Wall Street. The six Iceberg users I interviewed recently were all satisfied customers, and some have already gone back to StorageTek for more.

The U.S. Postal Service has five icebergs in production with a total capacity of 1.2 Tbytes, "and we haven't lost one byte of data or missed any processing cycles," said Bill Maguire, acting manager of technical support at the Raleigh, N.C., data center. The post office has run into some power supply and microcode bugs, but Maguire described those as expected "bumps in the road."

Iceberg gets credit from Maguire and other users for advanced functions such as data compression and the ability to write updates to any spot on a disk. However, others are not so impressed. Galileo International, an on-line reservation consortium in Englewood, Colo., has not tried out Iceberg yet. But Paul Quade, director of capital planning and resource management at Galileo, said feedback from early users convinced him that Iceberg would only provide performance advantages over rival products on a few of his applications.

Iceberg limitations

A lack of Escon support until the first half of next year also limits Iceberg's usefulness at leading-edge shops. Nick Allen, an analyst at Gartner Group in Stamford, Conn., said it will be another few months before Iceberg is "fully proven." By then, Amdahl and Hitachi Data Systems should be about ready to join IBM in marketing competing arrays.

StorageTek deserves some of the blame for the whirlpool of negativity that is trying to drag Iceberg under. Its wildly optimistic revenue predictions delivered last April are giving critics ample ammunition to bash the company. Users who are evaluating Iceberg are being kept under a nondisclosure cone of silence until they actually buy the array, making solid information hard to come by.

But keep in mind that the rumored problems have not been substantiated and are mostly coming from short sellers — and with about 8 million of StorageTek's 44 million shares now held by short sellers, they obviously have good reasons to beat up on Iceberg. "There's rampant manipulation going on with the stock," Allen said.

Iceberg may or may not become a big success — certainly even analysts without an obvious bias have some doubts about the array. But the product should be judged on its technical merit, and most of the hoopla on Wall Street has little to do with technology.

Stedman is *Computerworld*'s senior editor, large systems.

Briefs

Ford buys Convex systems

Ford Motor Co. plans to buy $10.4 million worth of Convex Computer Corp.'s technical computers for advanced vehicle design work. Ford will be getting one of Convex's C4640 supercomputers and two of its Exemplar SPP1000 parallel processors. The Exemplar systems will have 16 Hewlett-Packard Co. PA-RISC microprocessors, according to Convex. The three machines are scheduled to be installed at Ford's automotive operations in Dearborn, Mich., between now and next June.

Glaxo to build system

Glaxo Holdings PLC, an international pharmaceutical company, said it is building a document management system for 10,000 users. Glaxo selected Documentum, Inc.'s Document Enterprise Management System for the management and workflow engine.

Reworked unit at Sequent

Sequent Computer Systems, Inc., which last January folded channels and sales into its operations units, said the move generated too much channel conflict. It has now set up a worldwide field operations unit to oversee channels and direct sales.

Sabre parallel systems reduce transaction costs

By Craig Stedman

Things do not always go as expected — sometimes they get better.

When Terrell Jones, president of The Sabre Group's information systems unit, first got wind of IBM's new general-purpose parallel mainframes, he did not think the air-cooled, CMOS-based hardware would have enough muscle to be of any use to him. Neither did Sabre's contacts at IBM, Jones said.

Introduced in September, the general-purpose parallel systems are supposed to be more mainstream than the specialized transaction and query engines that IBM released last spring. However, they are limited to about 60 MIPS of power across six processors — the same amount a traditional, water-cooled ES/9000 can squeeze out of a single CPU.

As a result, this first batch of parallel machines was intended mainly for so-called "back-level" shops — the ones that are still plugging away with their old 3090s, 3080s and 4381s. That is hardly the image that springs to mind when it comes to The Sabre Group, which handles reservations and ticketing for parent company AMR Corp.'s American Airlines, plus 52 other carriers and a network of travel agencies and corporate travel offices.

Lower-cost lure

Sabre Computer Services was indeed one of the first customers to install the new Parallel Enterprise Servers (PES), which promise lower operating costs than water-cooled mainframes. The IS unit's data center in Tulsa, Okla., has been running about half of Sabre's ticket pricing work load on a pair of PES systems since late July, according to Jones.

To be sure, the parallel hardware does not yet have enough processing or I/O capacity to take on the rigors of Sabre's reservation system. "It will be a while before we can put them in the main tent," Jones said. And while the thought of adding more ES/9000s to the four Sabre already has is not very appealing, the company will probably have "no alternative" as reservation capacity needs to increase, he added.

Ticket pricing is a less I/O-bound application, though, and the PES has successfully found a role there, Jones said. The parallel systems have been humming along nicely, even through an August fare war that pushed Sabre's combined pricing and reservations work load to an all-time high of 4,102 messages per second, 30% above the normal level.

The main allure of PES was the low level of environmental needs for air-cooled CMOS technology, Jones said. Sabre was straining the limits of both its ES/9000 processing capacity and its power and cooling facilities. The company especially wanted to avoid expanding the infrastructure for water cooling "because that's not where our long-term future is," he added. "I want to close floors in my data center, not open them."

Holding the line on power and cooling may eventually become impossible if new ES/9000s are in fact necessary, Jones acknowledged. But Sabre was at least able to postpone that investment by opting for the parallel hardware, which uses only 10% of the power and floor space required by traditional mainframes based on emitter-coupled logic processors, Jones said.

Jones would not comment on the amount of money Sabre is saving by using the PES systems, but he said the move "made very good economic sense for us" when factors such as power and maintenance were taken into consideration. "You have to look at the full operating costs. If you just look hardware to hardware [between the PES and ES/9000s], it's not as appealing."

No code conversion work was needed to put the pricing application on the parallel hardware, Jones said. "We just turned a wheel and started firing transactions at it, and it ate them up. It's really sort of been a nonevent."

Michael Jones, a Sabre Computer Services vice president who manages the Tulsa data center, said the only real glitch involved the user interface on the PES' front-end console, which had too many layers to plow through.

The MVS-oriented interface "was obviously not built for" the Transaction Processing Facility operating environment that Sabre uses for the pricing application, Jones noted. "There were multiple screens to drill down through, and it was taking us about two times as long [as the ES/9000s] to bring the parallel systems up." IBM has since eliminated the problem by streamlining the interface, he said.

All in the marketing

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said IBM eventually wants to position the parallel systems as large servers that can draw new application development back to the System/390 environment. For now, though, the PES machines are being marketed as "small, cheap, old-style mainframes" that cost less to run than the actual old-style mainframes.

That is good enough for Sabre, which expects to add a third PES by year's end, Jones said. One other benefit of being an early adopter is that Sabre can gain experience with the parallel technology "so that we're prepared to take advantage of it as it grows," he added. "I want to blow the big chillers out" as soon as possible.

ON SITE

The Sabre Group
Fort Worth, Texas

Goal: To add needed mainframe processing power at a reduced cost and without expanding power and cooling facilities.

Strategy: Sabre installed two of IBM's new air-cooled parallel mainframes, which now run half of its airplane ticket pricing work load.

Results: Transaction costs have been reduced, and the company avoided application conversions and data center investments. The parallel systems worked without problems through a recent fare war in which Sabre's message rate was at an all-time high.

Storage management

CONTINUED FROM PAGE 73

tended expressly for easier administration at remote sites. It is slated to ship in November.

In addition, there is little interoperability among the PC LAN backup solutions. That made it expensive for Kevin Reilly, vice president of information systems at Richardson Electronics Ltd. in LaFox, Ill. He is currently using Legato's Networker for his Unix servers and Cheyenne's Arcserv for NetWare.

> "It would take me forever across the WAN to recover the machines from the mainframe."
> — Michael Kotek, McDonald's Corp.

But because Networker cannot read Arcserv backup, he plans to standardize on Networker. "I'd love to have one backup system in case of failure," Reilley said.

A standard called System Interchange Data Format (SIDF) is intended to require vendors to record tape data in a standard way. Palindrome already supports SIDF and Cheyenne said it would be included in the next version of Arcserv.

In the end, neither method — centralized or distributed — is likely to emerge as a clear winner.

"If you had 100 units of data, 15 units might be transmitted to a central repository," said Dan Friedlander, an analyst in Boulder, Colo. "But that leaves 90% that isn't, and it will be protected in other ways."

Security first

Northwestern Mutual Life Insurance Co. in Milwaukee is serious about storage management. It has to be. The company's security auditors routinely check to make sure it is.

And how does Jeff Koeberl, senior systems analyst, keep the auditors happy? He collects 80G bytes of data from 30 Novell, Inc. NetWare file servers and a Hewlett-Packard HP 9000 and stores it in the same place as Northwestern's MVS and VM data: on 3480 cartridges in two Memorex 5400 automated tape libraries.

"The idea was, if I could get the [LAN administrators'] data onto 3480 cartridges, they were just as covered as MVS, and the auditors were happy," Koeberl said.

As it is with many of his peers, centralizing through the mainframe was Koeberl's first instinct. The reasons: control, plenty of capacity, superior automation and more reliability.

"Everyone's so quick to get to the nice things of client/server. It's easy to overlook the things that get it up to the same level of protection as the host," he said.

"The ideal is to get the backup data centralized in one location so you can do what you have to," said Miriam Huebscher-Scott, a systems engineer at Progressive Casualty Co. in Mayfield Village, Ohio.

With 135G bytes of distributed data to manage, "automation is key," Huebscher-Scott said.

And save for a few key functions — such as automated archiving — large system players are successfully evolving their highly automated storage solutions for network environments to the extent that the market will reach $200 million by 1997, according to Peripheral Strategies.

IBM, Legent Corp., Computer Associates International, Inc., Sterling Software, Inc., New Era Software Systems, Innovative and Network Systems Corp. are all on the list of providers.

But Koeberl has something many systems administrators may not: two 16M bit/sec. Token Ring backbones dedicated to backup. For many sites, network limitations are a fatal sticking point for transmitting bulk backup data to a central site.

"The mainframe people keep trying to say that [centralizing backup] is a good thing to do, and we tell them to forget about it," said Mike DeTuncq, a senior network analyst at Arco Permian in Midland, Texas. "TS could be effective, but then your costs would be prohibitive." — *Mary Brandel*

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FOCUS GROUP, LOS ANGELES, 1994

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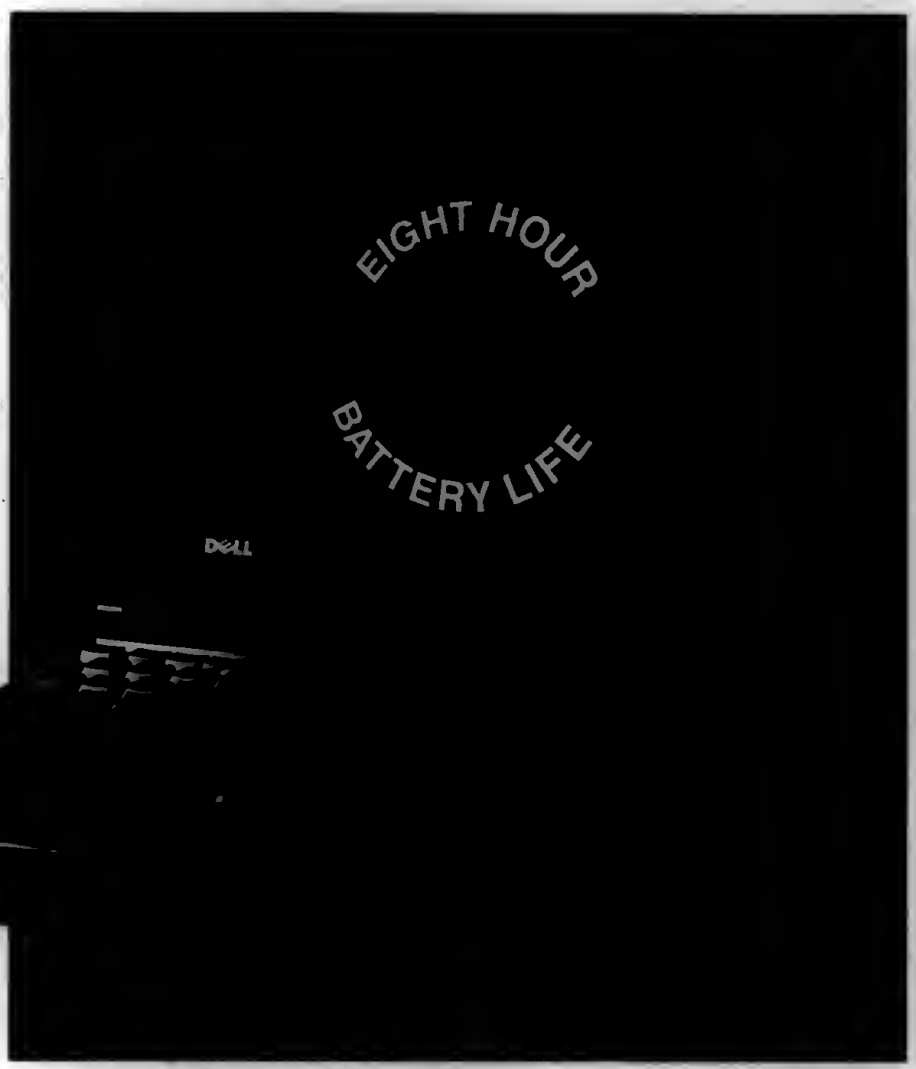
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IDC Insight: An Exe

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Salespeople working out of briefcases access customer records in an instant; service technicians working out of panel trucks carry fewer spares; auditors migrating from customer site to customer site spend more time with clients.

Indeed, companies that routinely equip their mobile field workers with mobile computers reap significant productivity gains as a result.

These are some of the conclusions of a recent study of more than 400 large and medium-sized U.S. organizations involved in field force automation. The study was conducted by International Data Corporation (IDC), the world's leading information technology market research firm.

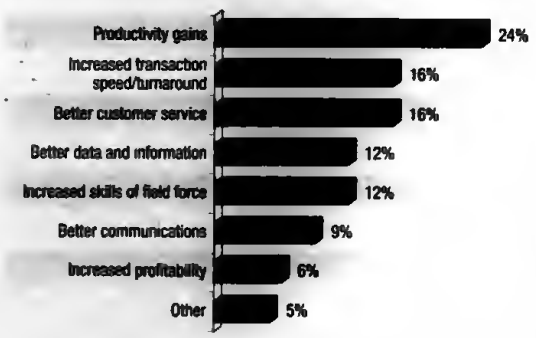
An in-depth summary is available in a special IDC White Paper on Field Force Automation (see box, bottom far right).

Organizations successfully automating their mobile field forces are reaping significant increases in productivity and gaining competitive advantage

Information technology professionals understand the challenge of automating mobile workers. Technical support, training, and system management are different for mobile workers than for their office-based peers. The autonomy of field workers makes implementing enterprise systems and procedures more complex. According to the IT professionals polled, one of the challenges easiest to underestimate is field force resistance to change.

Figure 1 — Productivity Drives Field Force Automation

Mentioned as Top Benefit of Field Force Automation by IT Professionals
(Percent of 289 Total Mentions)



IDC Survey Results, Mid-1994, N=206

Study Findings

- Over 70% of large and medium-sized companies are in some phase of field force automation.
- IT professionals saw productivity improvements as the key benefit of field force automation.
- Over 25% of respondents feel they are ahead of their peer companies and gaining significant competitive advantage as a result.
- Almost 60% of the respondents feel their automation efforts had met or exceeded expectations.
- Key success factors include top management support, training, and a good working relationship between the departments involved.

The benefits of taking on the challenges of mobility, however, are clear, as illustrated in Figure 1. They extend from more service calls per day and more time with sales prospects to better customer service through improved order turnaround. Some companies also see direct financial returns, like increased revenue and profitability.

Keys to a Winning Implementation

If increased productivity is a key goal of field force automation, what are the key steps to achieving it? IDC asked those whose field force automation projects had exceeded expectations to rate critical success factors (see Figure 2).

Comparing their responses with the sample as a whole suggests that key factors that differentiate an implementation that exceeds expectations from one that merely meets them include top management support, clearly defined requirements, cooperation between IT professionals and end users, and hardware vendor support.

None of these factors exists in a vacuum. Field force automation requires a systematic approach to application development, technology acquisition, training, support, and even internal selling. Most companies spend practically as much time in planning—almost half a year—as they do in the rollout of the application.

Although much of the software running on the mobile computers used by field forces is shrink-wrapped—word processing, spreadsheets, schedulers—much is custom developed. Developing a successful field force automation application requires all the rigor demanded by any enterprisewide, mission-critical application.

Working in Concert

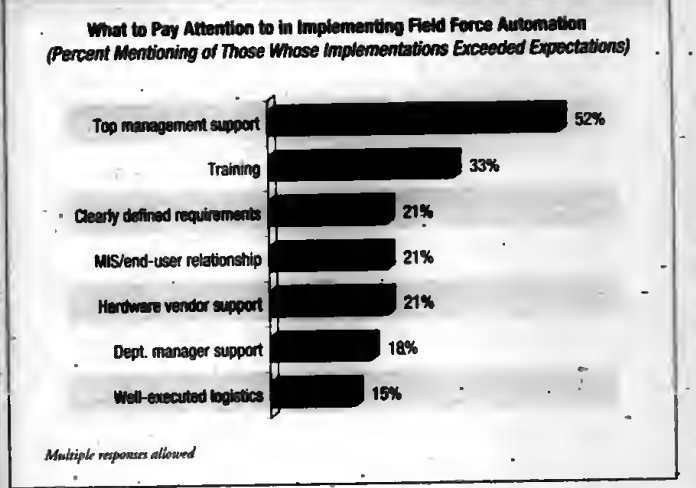
Developing a field force application also means working in partnership with user departments. Obtaining top management support requires commitment from both IT professionals and end users; implementing the application requires ongoing cooperation. IT professionals and end-user department managers polled for the most part agreed on goals and benefits, but differed on some critical points:

cutive Briefing

gh Field Force Automation

mputer Corporation

Figure 2 — The Keys to Successful Field Force Automation



- User managers saw more need to improve communications with the field.
- IT managers saw more need for cooperation with user departments.
- IT managers were more worried about hardware availability.
- User managers expected implementation to take 30% longer than MIS did.

Finally, IT professionals tended to worry more about logistics, support, and technical issues—the areas in which study respondents most often ran into unexpected problems. Multiyear, multisire, multiversion applications are not easy to roll out.

Going Forward

Like any potentially mission-critical enterprise application, field force automation requires continual investment (see box, upper right). New employees must be trained, the applications expanded and upgraded, and new equipment installed.

New functional areas are also open for automation—70% of the companies interviewed were automating more than one functional area. The sales function is the most likely to be automated. Following sales are accounting/auditing then maintenance and repair. Other auromated field activities include insurance claims adjusting, project consulting, mortgage lending, and field research.

The mission-critical nature of field force automation and the likelihood of continued application evolution lead to the final success factor: an organization's relationship with its supplier and its choice of technology. In field force automation, the supplier of notebook computers must be a full business partner.

The supplier needs to be in the market for the long haul. Its service and support must be up to mission-critical standards, its product line continually refreshed, and its reputation and viability as a company must be beyond concern.

It must also recognize the user's need for programmed upgrades, asset management, and ongoing logistical support. With the average field force automation project taking almost two years, from design through full roll-out, several product generations may occur during the life of the project. The right vendor is geared for volume fulfillment and support across time and distance.

The computer itself must be reliable, portable, and available when and where needed. It must also have the connectivity to operate in an enterprise computing setting.

Only after a vendor and its products match these criteria should price enter the equation. The cost of the hardware is, after all, a small part of the total implementation cost.

The Call to Action

The paybacks reported by companies with automated field forces should motivate others to increase their own pace of automation. The success of field force automation relies on skills and experiences built over time, meaning it is essential to automate sooner rather than later. Organizations not automating or upgrading now run the risk of falling even further behind.

Maintaining the Edge

Once a field force automation application is up and running, success factors change. Leading-edge companies considered the following most critical:

- Continual upgrading of hardware and software: 31% of respondents
- Continual investment in training: 25%
- Ongoing support for end users: 20%
- Management support: 16%

If there's a single message, it's this: field force automation is no longer an experiment in technology. It's a mainstream way of doing business.

– John Gantz
Senior Vice President
International Data Corporation

This Insight was written independently by IDC and sponsored by Dell Computer Corporation. For a complimentary copy of IDC's full White Paper on Field Force Automation, please call Dell at 1-800-396-3040.

DELL

Platinum Technology, Inc. has announced TSreorg, a mission-critical tablespace reorganization tool for Oracle Corp. database management in client/server or single CPU environments.

According to the Oakbrook Terrace, Ill., firm, TSreorg lets database administrators restructure tablespaces, tables and indexes without having to rebuild the database structure.

The product reorganizes individual tablespaces instead of the whole database, partitions tables onto multiple-disk storage devices and provides a fast reload option. The interface gives the look and feel of OpenLook, OS/2, Motif or Windows, regardless of platform.

Prices range from $250 to $18,000 for the agent component. The graphics console costs $6,000.

▶ *Platinum Technology*
(708) 620-5000

Automated Technology Associates has announced an enhancement of its ERBD relational database management system to include support for development tools and massive databases.

According to the Indianapolis firm, ERBD has incorporated the X/Open Co. interface standard so that developers can use their choice of computer-aided software engineering tools and work in a common development environment.

A mated-pair backup option lets users back up data locally or over a network to a remote site. It also supports continuous rolling archiving.

Prices start at $10,000. The mated-pair backup option costs $7,500.

▶ *Automated Technology Associates*
(317) 573-9000

Ascent Solutions, Inc. has announced PKZIP AS/400 and PKZIP ICL DRS/6000, data compression utilities.

According to the Dayton, Ohio, company, PKZIP AS/400 is a mainframe data compression utility that features support for IBM AS/400 SAVF files and the ability to convert record-oriented data used on OS/400 systems into stream-oriented data. PKZIP ICL DRS/6000 is a data compression utility for Unix that features 32-bit Cyclical Redundancy Checking and the ability to read all ZIP files, regardless of version.

Prices range from $600 to $8,900 for the AS/400 version; the ICL DRS/6000 version costs $189.

▶ *Ascent Solutions*
(513) 885-2031

Syncsort, Inc. has announced SyncSort VSE 2.3, a sort, merge and copy utility for IBM mainframes running VS, VSE, VSE/SP or VSE/ESA.

According to the Woodcliff Lake, N.J., company, SyncSort VSE 2.3 improves program CPU time, supervisor CPU time and elapsed time.

The product manages data space so that multiple sorts can exploit virtual sort work concurrently. It automatically reblocks Sortin/Sortout and supports concatenated Sortin.

Prices start at $2,400 per year depending on license term.

▶ *Syncsort*
(201) 930-9700

Software Engineering of America has announced ODDS/MVS 4.1, automation software for MVS environments.

According to the Franklin Square, N.Y., firm, ODDS/MVS 4.1 includes a new application automation facility. The facility lets data centers design automation rules that access CICS systems and perform inquiries or control complex system environments.

Prices range from $14,000 to $32,000 for a site license.

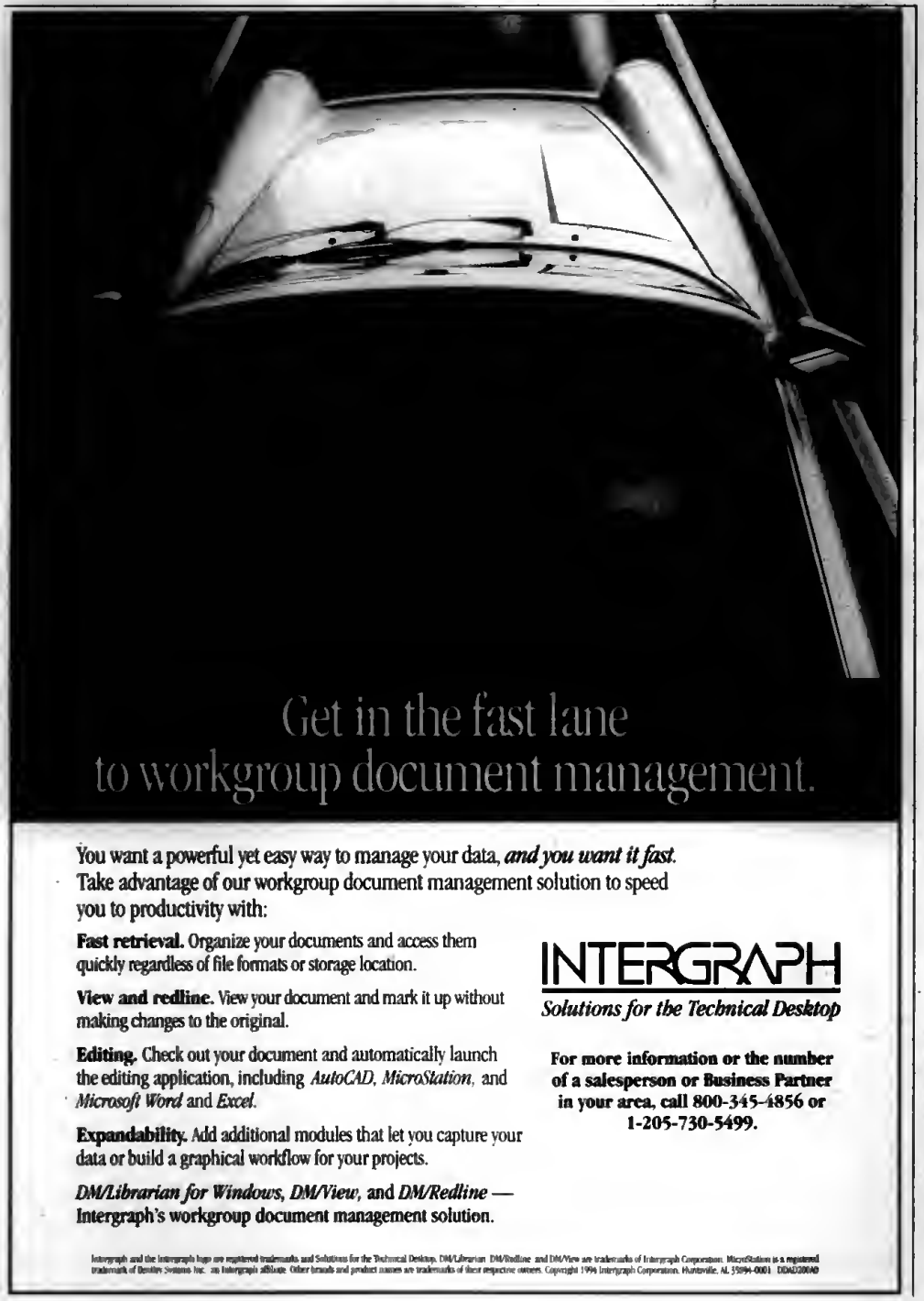
▶ *Software Engineering of America*
(516) 328-7000

ESI/Technologies has announced Events Driven Requirements Planning (ERP) and Activity Based Cost Management (ABCM), modules for ESI's EMIS family of global manufacturing software.

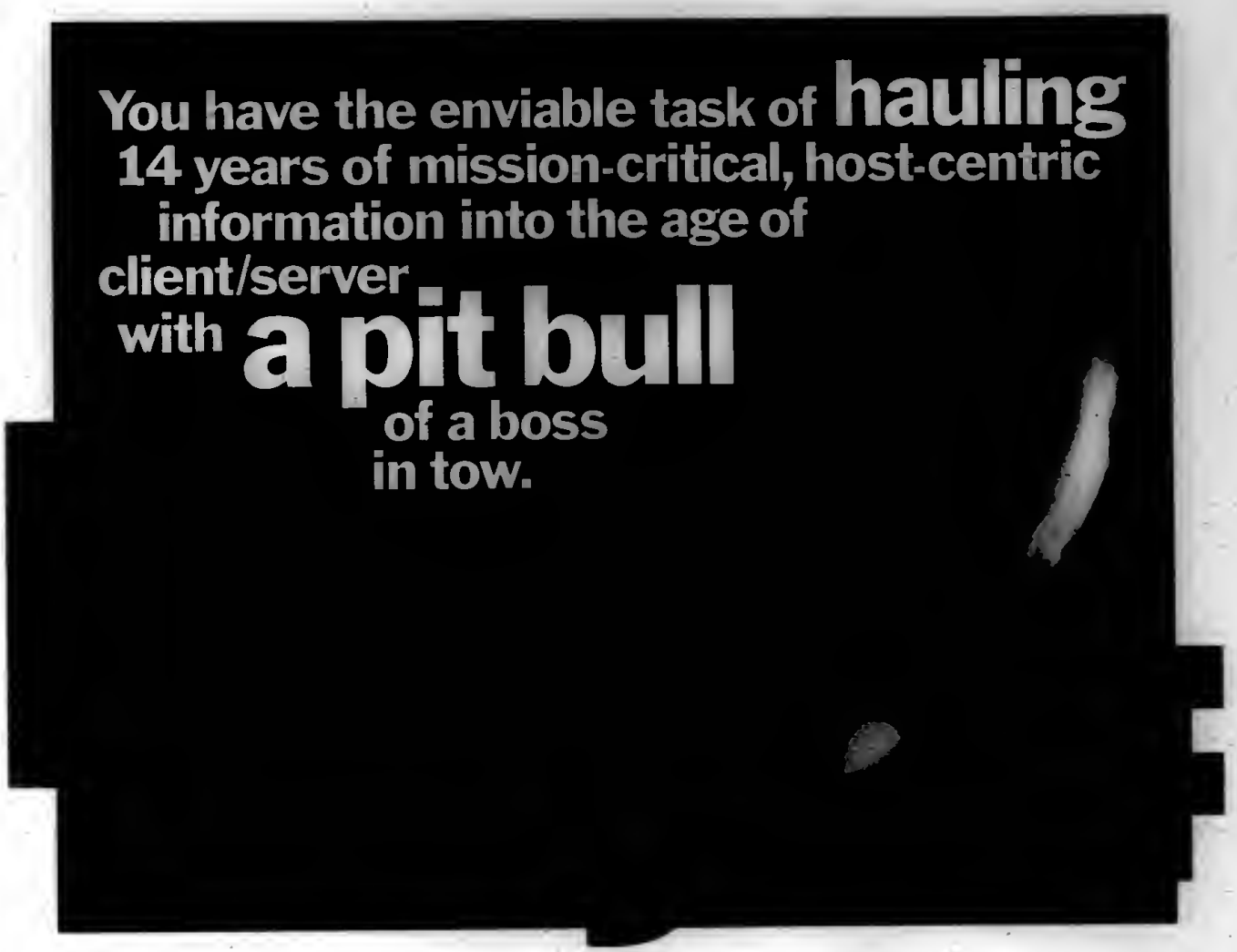
According to the Buffalo, N.Y., firm, the ERP module provides real-time requirements planning. The ABCM module identifies the costs of each product and provides a view of how the product mix contributes to the bottom line.

Prices range from $10,000 to $40,000.

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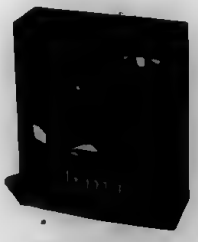
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PROGRESS SOFTWARE

New tools ease client/server development

Novadigm, Powersoft plan to integrate products

By Rosemary Cafasso

A recently announced plan from Novadigm, Inc. to integrate its software distribution technology with the Powersoft Corp. PowerBuilder application development tool has left some users anxious to hear more.

"I think it's going to make our lives easier," said Beverly Loftis, a technical services supervisor at Florida Power & Light Co. in Miami. "It will really help with new development."

Users can now work with both Powersoft's PowerBuilder and Novadigm's Enterprise Desktop Manager (EDM) by loading EDM with data about newly designed applications or upgrades. EDM then electronically distributes the software to users.

Powersoft and Novadigm have agreed to work together to link the two products so that EDM is automatically synchronized with PowerBuilder. Novadigm could not provide a specific delivery date for this capability but did say the target date is in the first quarter of next year.

Integration needed

Tom Hennessy, a manager of distributed systems at Apprise Corp., an information systems services company in Morristown, N.J., uses both products and said he wants more integration.

"Powersoft is a whole suite of tools and runtime modules," Hennessy said. "If they change a runtime module to fix a bug, that has to be migrated to every desktop that's running the application. Depending on the criticality of the changes, Novadigm makes that relatively easy to do."

Loftis said she expects that tighter integration between the products will help her staff to better coordinate complex development efforts.

"When you put together a client/server app, there are lots of different pieces," Loftis said. "You try to put it together to go out to a group of desktops, and you've got to pull all those pieces together. When multiple people have put it together, it's hard to find that one person who knows the whole thing."

Although Powersoft has about 100 development or marketing partners, the Novadigm deal is its first software distribution partnership. John Wardley, a strategic alliances manager at Powersoft, said the deal addresses a discipline that users will continue to focus on as "client/server becomes more widely deployed and as it steps up to the enterprise."

Curt Monash, president of Monash Information Services in New York, agreed. "Software distribution is a key issue in general, and its importance will skyrocket as object-oriented technologies are used more fully," he said.

Softool increases support for CCC/Harvest

By Melinda-Carol Ballou

Softool Corp. has added more platform support to its client/server configuration management tool.

By the end of the month, the Goleta, Calif., company's CCC/Harvest will support IBM OS/2 and Microsoft Corp. Windows and Windows NT clients. The tool already runs on multiple Unix platforms and handles version control.

Version control allows organizations to track different versions of the code as it evolves. Configuration management lets developers manage code and other elements making up the entire project.

Taking atm

Harvest specifically targets configuration management in multiplatform environments. It supports native operating systems for each platform rather than using emulators, which give the appearance of interoperability, company officials said.

This native opersting system support offers performance benefits, said Marianne Forsyth, who is in charge of process improvement at Cubic Defense Systems, Inc., a San Diego defense contractor.

"Connecting multiple platforms and networks together are some of the key challenges with client/server development," Forsyth said. "We want to use Harvest because there are too many people trampling on each others' code."

Beneficial to users

Other benefits of CCC/Harvest include the following:

- it prevents people from making changes to obsolete versions.
- it prevents developers from making simultaneous changes to the same piece of code.
- it provides better audit trails.

Such audit trails are critical because changes to code can cause problems elsewhere in an application. Developers then have to find those changes to rectify the problems.

Intersolv, Inc.'s PVCS products are the leading tools in the market for managing these issues across Windows and some Unix platforms. Other companies targeting the Windows arena include Legent Corp., and Atria Corp. and Continuous Software Corp. focus on Unix environments.

But some PVCS users said the tool is difficult to learn and could present problems scaling up to higher-end client/server projects.

"We're not that limited yet, but we're now working on a fairly small scale," said Mike Hall, software engineer at National Instruments Corp., an instrument

Softool, *page 86*

PG&E revamps system with object-oriented apps

By Kim S. Nash

Six months after Pacific Gas & Electric Co. (PG&E) announced a three-way partnership with Microsoft Corp. and Ontos, Inc., the Bakersfield, Calif., ntility will begin to deploy cutting-edge object-oriented applications.

In April, the three firms announced they would work together to boild pure object-oriented applications in various operational and customer-service areas at PG&E. The systems, which will replace current mainframe software, will roll out beginning next month and will be deployed over PG&E's 20,000-node network.

But before any substantial work could be done, Ontos, an object database vendor in Burlington, Mass., had to port its Ontos/DB product to Microsoft's Window NT opersting system. Ontos and PG&E worked on that themselves without a lot of engineering help from Microsoft, according to Ontos Chief Executive Officer Jim Cannon.

Through the partnership, PG&E hopes to become one of a few sites where object databases are deployed enterprisewide rather than the more common object database scenario of a single or a few users on a LAN.

One of the initial applications is a transmission line-tracking system to monitor defects, repairs and ongoing performance of PG&E electrical lines. Information on weather conditions, electricity ebbs and flows and outage rates will be coordinated to give the company a better look at when and why transmission is affected.

A second application waiting for object-oriented capabilities is one that coordinates electricity delivery during outages.

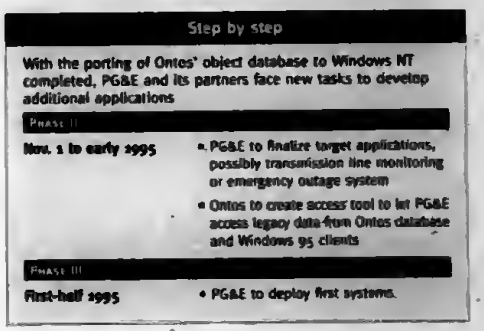
Accomplishments made

The three partners have completed the following tasks:

- PG&E has targeted the initial mainframe applications it wants to rebuild in an object environment.
- Microsoft has worked with PG&E to deploy Windows NT and early versions of Windows 95, the next version of Windows.
- Ontos has ported Ontos/DB 3.0 to Windows NT and expanded networking support. That is, the database has been tweaked to support three network protocols dynamically rather than one: TCP/IP, Banyan Systems, Inc.'s Vines and IPX.

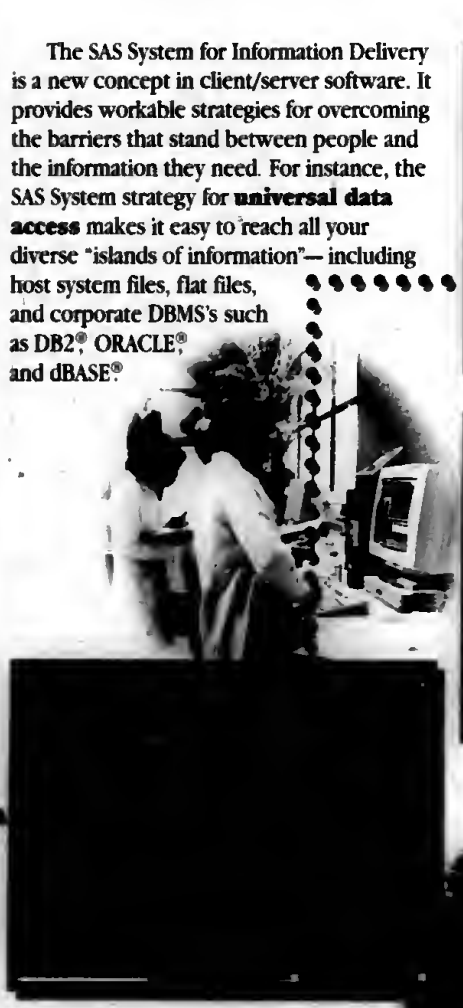
Next, Ontos must build data access tools to let PG&E and other users access data stored on mainframes from an Ontos application without having to move that information into Ontos/DB, said Todd Stone, director of strategic accounts at Ontos.

A so-called External Storage Manager in Ontos/DB 3.0 is the root of such a tool, Stone said. The Manager lets users store information as single objects or groups of objects in a sort of holding pen for such application meta data. Ontos plans to add a layer on top of that technology in the 3.1 release of the database that would let users see and manipulate nonOntos data, he said. That announcement is expected before the end of the year.



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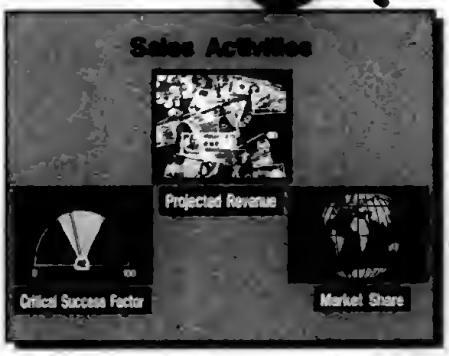
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HockWare ships visual programming tools

By Ed Scannell

■ Riding the recent OS/2 tools wave, HockWare, Inc. has announced delivery of two visual programming tools modeled after its long-standing series of VisPro/Rexx tools.

The tools, called VisPro/C and VisPro/C++, are tailored to work hand in glove with IBM's C/Set and C/Set++ compilers and User Interface Library. They feature a wide range of object-oriented drag-and-drop programming capabilities geared especially toward developing user interfaces.



"We have had pretty good success with [VisPro/C and VisPro/C++] for putting together front-end sorts of things," said Scott Samuelson, senior systems analyst at the Washington Public Power Supply System in Richland, Wash. "They have a better dialog editor than what comes with IBM's compilers."

Making use of SOM

The tools are fully integrated with IBM's Workplace Shell and make full use of IBM's System Object Model (SOM), which lets programmers create 32-bit multithreaded applications for a variety of client/server strategies.

Both products have three new integrated features intended to help speed development: a Build Options Editor that allows programmers to visually set compiler and linker options; a Build Monitor that enables programmers to monitor the progress of various compilations; and a Resource Editor that lets programmers easily define things such as icons and hit maps.

Full of features

Other features include a built-in visual DB2/2 database designer, a custom object builder based on IBM's SOM and a built-in spreadsheet, clock and calendar.

The built-in visual DB2/2 designer not only allows corporate programmers to more quickly create compatible applications but also reverse-engineer existing ones.

The E/R diagramming tool lets programmers drag and drop tables into a layout view that helps create a more complete database application. An innate advantage with this tool is that all applications are embedded with SQL.

VisPro/C and VisPro/C++ each carry a retail price of $399, although they will be offered at a promotional price of $199 until Dec. 1.

Softool increases tool support

CONTINUED FROM PAGE 83

control and scientific data acquisition company in Austin, Texas.

"As the project grows, you build this large mass of data that users would be poking at in the repository, rather than distributing relevant portions [of the project] to targeted groups," he said.

Wish list

Hall said he would prefer direct user coordination on a project, rather than have various users going to the repository and extracting what they need piecemeal.

While National Instruments has been doing version control for years, the company is just beginning to look at the big picture of configuration management.

"Client/server makes the problem more noticeable because you're distributing pieces out all over the place. Tying those pieces together requires overseeing the functional and management issues," Hall said.

Intersolv has also attempted to fill in the gap for development tools in version control and configuration management capabilities via links to products such as Powersoft Corp.'s PowerBuilder, Microsoft's Visual Basic and LBMS, Inc's LBMS.

Toby Moriarty, product manager for PVCS, said PVCS scales up to support "any number" of users and files. She would not provide a specific number.

Little knowledge

Developer knowledge about configuration management issues appears to be lacking, according to a standardized test released by R. S. Pressman & Associates, Inc., an Orange, Conn., consulting firm. Out of 2,400 software developers in North America who took the test, managers scored 60% and practitioners scored 50% out of a perfect score of 100%.

Business Objects upgrades

Latest release will offer Macintosh, Unix Motif versions

By Kim S. Nash

Business Objects, Inc. is slated to announce Unix Motif, Unix Character and Macintosh versions of its database query tool today as part of a product upgrade.

Also included in the BusinessObjects 3.0 release, which is available immediately, is an expanded report writing feature called BusinessAnalyzer. BusinessObjects has historically been a database query tool, but now has been reworked to let end users build reports using pull-down menus and other graphical features.

In general, the product translates SQL used in popular relational databases, such as those from Sybase, Inc. and Oracle Corp., into general business terms that nontechnical end users can understand. Database administrators at user sites must configure BusinessObjects to do this translation.

Indianapolis-based DowElanco, an agricultural chemicals joint venture between Dow Chemical and Eli Lilly, has beta tested the Macintosh version of BusinessObjects 3.0. "IS is thrilled because they're doing different things and no longer spending their time programming screens," said Sandra Bazarian, senior information systems analyst at DowElanco's information services division.

Several large deals with global customers — including Sun Microsystems, Inc. — helped prompt Business Objects to ports its formerly Windows-only tool to Motif and Macintosh, said Perry Mizota, vice president of marketing at the Cupertino, Calif., firm.

Increased support

Other new features in 3.0 include the following:

- Support for Microsoft Corp.'s Open Database Connectivity interface.
- A driver to Red Brick Systems' data warehouse.
- Integration to any SQL-based application development repository via a feature called CASE Access.

Pricing is $595 per user, plus $3,495 for a manager module that sits on a server. A typical scenario requires one server piece for every 20 users, Mizota said. BusinessAnalyzer costs $295 per copy.

Briefs

Microsoft plans translation tool

Microsoft Corp. said it will ship by year's end a translation tool that lets Word 6.0 users automatically generate files in Standard Generalized Markup Language (SGML) format.

SGML Author for Word, which will cost $595, will generate SGML-tagged files without requiring users to learn the formatting language, thus lowering training costs for users in government and other industries that use SGML extensively, said John Vail, Word product manager.

Bachman unveils Terrain

Bachman Information Systems, Inc. recently introduced Terrain, a tool for creating and delivering client/server database designs. Terrain is a Windows-based visual tool that supports database development from prototyping through delivery and maintenance. It can be used in conjunction with Bachman's Ellipse tool for building scalable client/server applications, officials said.

The company seeks to benefit from revenue generated from the products. It is now in the process of seeking further capital to deal with significant cash shortfalls, according to several industry sources.

Progress enhances tool

Progress Software Corp. recently said it plans to add application templates, controls for reusing objects and other enhancements to its Progress Version 7 database and development tools. Progress 7.3 is due to ship next month, with prices starting at $7,500, according to the Bedford, Mass., company.

CE Groupware expected

CE Software, Inc. laid out an architecture for building middleware software that will let users build groupware applications using their electronic-mail and database systems. The architecture is called CE Groupware Architecture, and the first software products are expected to ship in mid-1995.

Watcom upgrades

Watcom International, a subsidiary of **Powersoft Corp.**, recently announced a major upgrade to its SQL database. Release 4.0 adds stored procedures, triggers and other features to offer Watcom SQL improved performance for client/server systems across platforms, company officials said.

CI Labs joins OMG

Component Integration Laboratories, Inc. said it will join with the Object Management Group (OMG) to openly evolve and promote industry standards for software interoperability. CI Labs and the OMG have exchanged corporate memberships, and CI Labs' founding sponsors are also now full corporate members of the OMG.

IBM introduces StorePlace

IBM recently introduced StorePlace, an OS/2-based, object-oriented application development environment designed for the retail industry. StorePlace will be implemented by **Woolworth Corp.** in 7,000 of its stores across 13 countries beginning next year.

Oracle to support AS/400

Oracle Corp. development tools will now support IBM AS/400 systems via Open Database Connectivity devices.

[redacted]

Softlab, Inc. has announced Maestro II Redevelopment Workstation (RTW) 2.1, a maintenance and redevelopment environment.

According to the Atlanta company, Maestro II RTW 2.1 features enhanced change management, source control, application scanning, a link to Micro Focus, inc.'s Cobol Workbench, configuration management and a mainframe interface.

The product runs under Windows, OS/2, Unix and DOS and lets large teams of users maintain mainframe legacy systems and identify existing mainframe components for reuse in client/server or other architectures.

Maestro II RTW 2.1 costs $10,000 per workstation.

▶ *Softlab*
(404) 668-8811

SunSoft, Inc. has announced SunSoft WorkShop 1.t, a suite of development tools for object-oriented applications on Unix platforms, and SPARCworks/Impact 2.0, a development tool for multiprocessor application development.

According to the Mountain View, Calif., company, SunSoft WorkShop 1.t features a rapid header processing system for faster C++ compiling, source code editing capability for all languages and versions for C, C++ and Fortran.

SPARCworks/Impact 2.0 features a thread analyzer to collect performance information, a LockLint feature that analyzes C source code during compilation and a LoopTool function that speeds analysis of parallel programs.

Prices for SunSoft WorkShop 1.t range from $2,195 to $3,195, and SPARCworks/Impact 2.0 costs $995.

▶ *SunSoft*
(415) 960-3200

Itautec/America has announced Guaranteed, Reliable, Interoperable Processing (GRIP) software, a development tool for integration of host-based transaction technology in Novell, Inc. networks.

According to the Dennis, Mass., firm, GRIP allows developers to build client/server applications by hiding the complexity of the transaction processing monitor.

GRIP manages a pool of transaction agents and incoming transaction requests, matches requests to agents, monitors the progress of the transaction and provides failure recovery.

Prices start at $4,000.

▶ *Itautec/America*
(508) 385-8181

Bluestone Consulting, Inc. has announced DB-UIM/X 2.6, a client/server application development environment for relational databases.

According to the Mount Lanrel, N.J., company, DB-UIM/X 2.6 provides visual programming while letting developers base their code on C or C++.

The product supports Oracle Corp.'s Oracle 7 as well as Dynamic SQL capabilities for both Sybase, Inc. and Oracle products.

DB-UIM/X 2.6 costs $6,500.

▶ *Bluestone Communications*
(609) 727-4600

UnderWare, Inc. has announced Track Record 1.5, an information tracking tool for Windows.

According to the Boston firm, Track Record 1.5 lets software developers track the details of their software projects, including bug reports, suggestions, releases, test cycles and schedules.

The product tracks ongoing tasks dynamically and maintains a project history. Features incinde configurable graphing functions and security for larger workgroups.

Track Record 1.5 costs $159 per user.

▶ *UnderWare*
(617) 267-9743

Product short

Advanced Software Technologies, Inc. has introduced Graphical Designer, a Unix-based computer-aided software development tool. Developers can select an object-oriented methodology to express high- and low-level designs in a graphical format while automatically generating C, C++ and Ada code. Cost: starts at $4,999. Advanced Software Technologies, Littleton, Colo. (303) 730-7981.

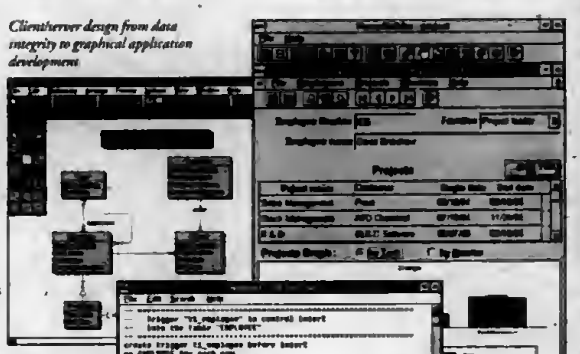


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MOTOROLA

Thinking about long-term IS planning? Think again.
Page 97

What's the meaning of this?!



MARK ALCANTARA

STUART E. MADNICK AND MICHAEL SIEGEL *are creating a context interchange model*

As organizations continue to build networks and as mountains of data arrive on desktops without information to put it in context, IS personnel will be asked to sort out the mess

BY [illegible] L. RAY

At IBM headquarters, staff members regularly demand sales projections from international managers, a routine task for most of the company's foreign divisions. But when it came to IBM Brazil, the figures always seemed grossly inflated.

The home office in Armonk, N.Y., berated the Brazilian executives, and bad feelings emerged all aronnd. But the problem could have been resolved without shouting.

Instead of projecting sales, executives at the Brazilian subsidiary submitted figures of what they would ideally like sales to be. In this case, the meaning of "project" depended on the circumstances in which it was used.

Unchecked, this type of interpretation problem will only get worse. Organizations continue to build networks, and growing numbers of LANs

What's the meaning, *page 92*

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What's the meaning?

CONTINUED FROM PAGE 89

and WANs are hooking up to the lattice work of worldwide data links. As that happens, people will increasingly run into information that makes no sense to them, according to Stuart E. Madnick, a management science professor at MIT's Sloan School of Management in Cambridge, Mass.

As this glut of contextless information arrives on corporate desktops, information systems managers and staff will frequently face the task of sorting out the mess. Users throughout the organization have their own parochial way of representing and interpreting data, Madnick says. And the people in the middle are, as often as not, members of the IS staff.

"We'll get more and more information which we know less and less about," Madnick says. He paints a picture of a maturing information age in which people will increasingly encounter data that contains hidden assumptions. Does the number on the screen stand for money or time, dollars or yen, thousands or millions, last year's sales or just today's?

For the past several years, Madnick and Michael Siegel, a fellow research scientist and colleague, have been trying to untangle the problem of how to correctly interpret information outside its local context. Data understood in its original environment can be virtually meaningless elsewhere, Madnick says.

Madnick and Siegel are talking about context interchange, the core of their theoretical work. Their inquiry has led to a deepened understanding of the issues of context interpretation.

It has also generated initial design work for systems that will perform efficient context interchange in tomorrow's world of distributed computing. They say they expect to see a modest implementation of their context interchange model by the end of the year, a large-scale version by the end of next year and a commercial application in 1996.

Madnick is quick to turn to examples to explain the nature of context. In his sometime capacity as an admissions reviewer, he examined the application of an Australian student whose high school transcript contained mostly Ds. When he asked why a school with such rigorous standards was considering such a student, the MIT admissions office told him that a D grade in Australia stands for "with distinction," the highest possible grade. Madnick had interpreted Australian data in a U.S. context and received the wrong message.

And while humans can use common sense to guess at possible meanings, computers don't have a clue if data arrives in unfamiliar forms. "Computers didn't create this problem, but they have to deal with it," Madnick says. A computer that registers $1,000 as a thousand dollars will not know what to do with USD1.000,00, a common European notation for the same thing.

Local communications are often conducted using abbreviated representations, Madnick says. Such shorthand creates efficiency but tends to strip out context, which is assumed to be understood by both sender and receiver. While it is theoretically possible to ship information with all of its assumptions, in practice, complete inclusion is difficult to achieve.

The price is right?

Three different tour books list these prices for the same French hotel

1,100	600	700

What's going on? The first number is in U.S. dollars; the others are in French francs. Why the difference between the last two? You can't tell without the context. Maybe the quotes are for high and low seasons or different quality rooms. In this case, the 100 franc difference results from the inclusion of a value-added tax in the higher quote.

Misinterpretations occur when the assumption between representation and meaning changes in different contexts. Stephen Brown, vice president of client services at Vality Technology, Inc., a Boston-based software firm that deals with context issues, says he often runs into the problem of data homonyms.

A homonym occurs when two data items look the same but have different meanings. Brown recently worked with a highly decentralized Chicago-based pharmaceutical company that had created a report to track sales of different product lines across organizations. The lack of a meaningful definition for the field territory rendered the report nearly useless.

The databases of the businesses had been integrated, but territory meant different things to different groups. For example, one group divided territories into states, another into regions and a third into groupings of ZIP codes. In some cases, the territory size differed dramatically. The report could not give a meaningful view of comparative performance.

Then there's the reverse problem, handling data synonyms. Another Vality client had numerous ways of designating its customers. Digital Equipment Corp. in Maynard, Mass., was represented in the client's various databases as Digital Equipment Corp., DEC, Digital Equipment, Digital, Dig. Equip. and so forth. Although all these entries had the same meaning, when the client's computer tried to count total sales to Digital, it produced bogus results.

"We don't consciously realize there's more than one way of doing things," Madnick says. The sender is unaware of all the possible ways that communication can be interpreted outside the local context, he says.

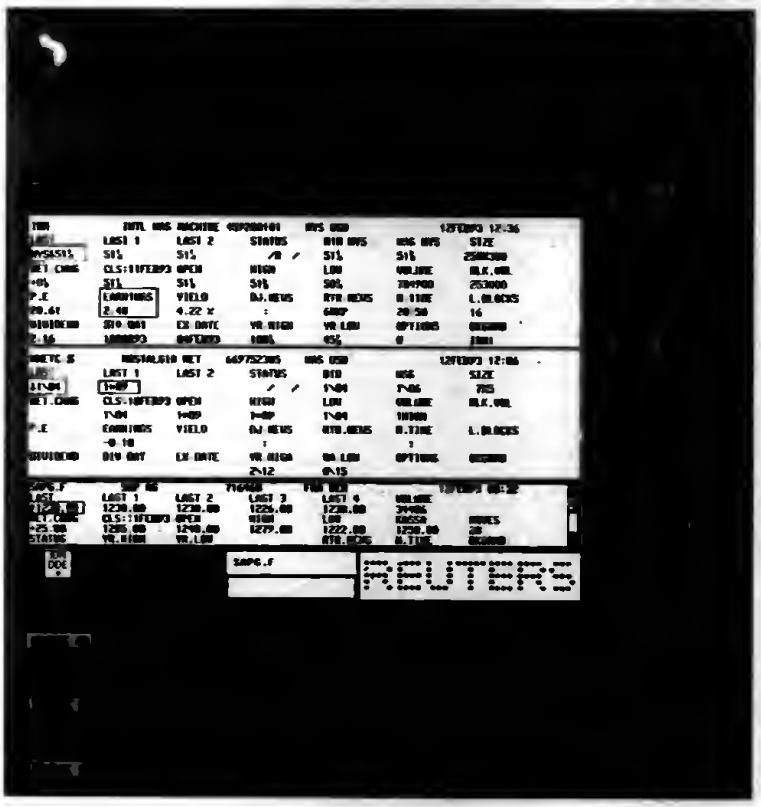
To make matters worse, context is not static; it changes over time, Siegel says. When the Reagan administration included the military in the base figure for calculating

CAN'T TELL HOTEL

Context is all-important when comparing information about the same hotel from two different hotel guides

	GUIDE 1	GUIDE 2	ACTUAL
[illegible]	No	Yes	Street parking only
[illegible]	Yes	No	Satellite link

No one is lying here. It's just a matter of interpretation. The hotel doesn't own a parking lot, so strictly speaking, it has no parking. But it is in a suburban location where street parking is not a problem. Although the facilities are not hooked up by actual coaxial cable, HBO and many other premium channels are delivered by satellite link.



"[Data] repository approaches fold data together but don't explain what it means."

— MICHAEL SIEGEL, RESEARCH SCIENTIST AT MIT'S SLOAN SCHOOL OF MANAGEMENT



unemployment, the rate dropped by .3%. Without knowledge of the change in context, an unwitting analyst going over the historical figures today might think the employment picture suddenly improved in 1983.

Context interpretation has already become an issue in a number of industries, notably financial services, insurance, transportation, manufacturing and medicine, Madnick says. All of these companies are expanding their markets geographically, integrating new technologies and increasing the use of networking to connect departments, functions, regions and other companies.

Most companies have yet to implement comprehensive solutions to the context problem and rely instead on ad hoc systems, Madnick says. Often, individuals note contextnal informatioo in personal files to help them do their jobs, never realizing that this vital data should be made available to the entire company. When they leave, the information gets buried. "Right now, in most organizations, it's hit or miss," Madnick says.

Some companies have addressed the problem and handle it as a centralized process. Banc One Corp. imposes an historically developed common financial language throughout the company.

"The first thing we do when we acquire an affiliate is teach them this language," said Beth Luchsinger, vice president of the bank's Marketplace Performance Group. This standard interpretation, applied to all information passing through the bank's system, permits managers in different branches to "compare information apples to apples," she says.

The process is not entirely driven by corporate edict, however. "Every quarter, the central system is adjusted to incorporate ideas contributed by new affiliates," Luchsinger says.

The answer is ...

As for providing answers, only a few vendors have risen to the challenge. Vality offers a centralized solution for companies with multiple, disparate legacy databases, says Steve Feldman, director of public relations. Vality's approach involves analyzing free-form text for patterns and relationships that indicate likely meaning.

For example, the string "TTE" in a name field argues that the person is acting as a trustee, which also implies the existence of one or more beneficiaries. Using statistical methods, Vality's system makes trial matches of potentially similar data to help resolve anomalies in data fields from different systems. For example, given a system of user-defined meanings, "Mr. Joseph B. Fine" could be found to match "Joe B. Fine." The end result is a new relational database with either a unified naming convention or defined links among heterogeneous terms.

But Siegel says, "the stuff that's out there is at least an order of magnitude more primitive than what we're talking about. Repository approaches ... are a way to fold data together, but they don't really help you explain what it means."

DISCLOSURE	VALUES	VALUES	DATALINE
COMPNO	3842	HOND	CODE
CF	19,860,226	28-02-86	PERIOD ENDING
NI	146,502	146,502	EARNED FOR ORDINARY
NS	2,909,574	2,909,574	TOTAL SALES
NRTAX	0.05	30.00	RETURN ON CAPITAL
NRCEX	0.11	19.57	RETURN ON SHAREHOLDERS EQUITY

The MIT model takes a decentralized approach. Users establish their own export contexts, which contain assumptions about their data that can be shipped throughout the network, and import contexts, which transform incoming data into their preferred format. Users also help build a dictionary of basic terms and their meanings. A context mediator reconciles differences in representation and meaning as messages pass through the system. Conversions from one context to another can be made directly between source and receiver or can reference conversion functions stored in an ontology, a dictionary of shared terms.

> As the information age matures, people will increasingly encounter data that contains hidden assumptions.

The professors tout this decentralized schema as superior to standards-based approaches. Madnick says systems based on standards are difficult to create and become out of date quickly as the business environment changes. A distributed approach is flexible, allowing systems to evolve gracefully and scale up easily. Also, a shared dictionary that defines basic terms can be used immediately, Siegel says.

Madnick says he expects context mediation services will become commercially available as the information superhighway develops. He predicts that companies offering such services will come from information sources such as Dow Jones, Internet service providers, entrepreneurs from industries such as dictionary publishing and information systems and systems integrators.

Until then, "at least people need to be aware of and make adjustments for possible context discrepancies," Madnick says. ■

Kay is a free-lance writer in Whales, Mass.

Deal of the century?

Example of a Reuter terminal display showing prices from nine companies ready to buy or sell American Depository Receipts in Reuter shares traded on the International Stock Exchange in London

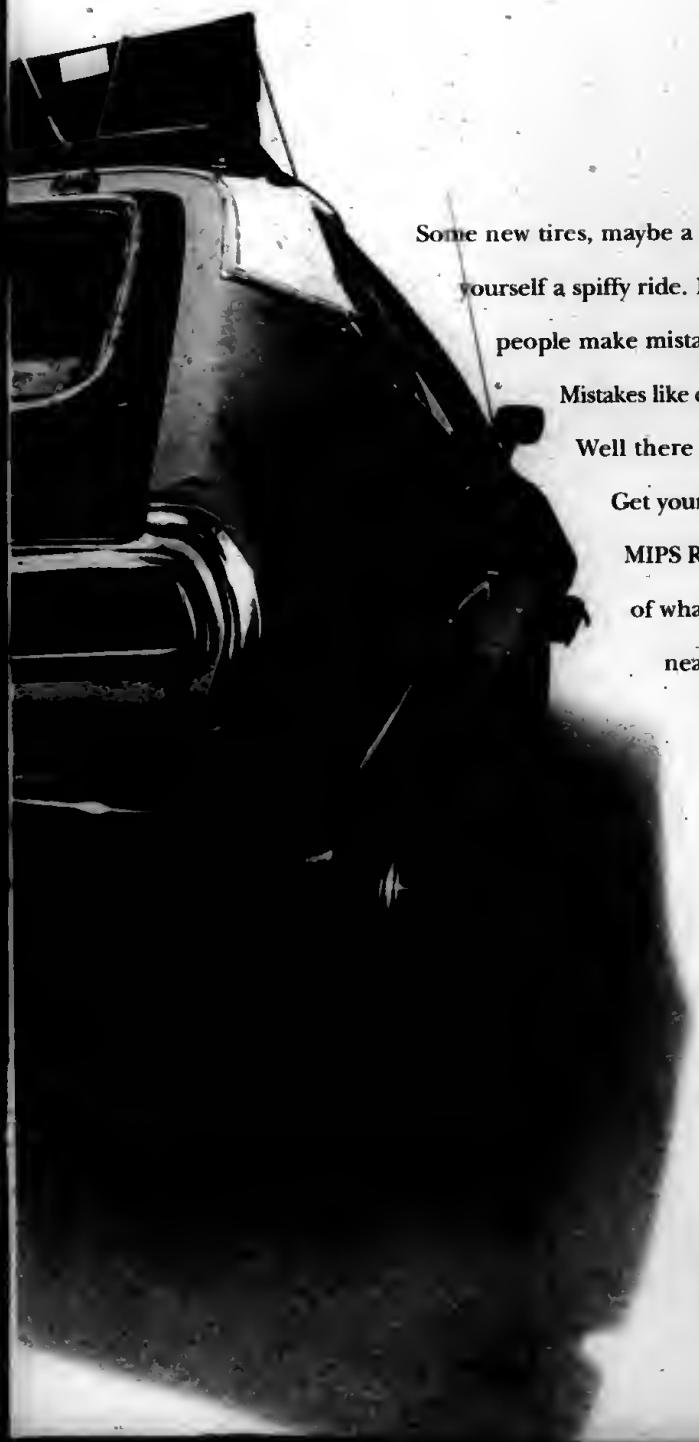
Wouldn't you like to buy 1,000 shares of Reuters' American Depository Receipts for $24.85 and sell your holdings immediately for $2,445? You'd make a tidy profit if it weren't for the fact that your fast fortune is an illusion. Some companies' quotes appear in U.S. dollars (i.e., 24.85) and others bid and offer in cents (i.e., 2445.00). The reason? The subscriber's terminal receives two feeds in different formats, one from Reuters and one from Telerate. The user is familiar with both contexts and interprets them correctly with hardly a thought. A computer would have a much harder time.



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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D Tech. Management
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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D Tech. Management
60. Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11. President, Owner/Partner, General Manager
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
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51. Sales & Mktg. Management
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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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Networking Products ❑ Yes ❑ No

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Allan E. Alter

The myth of long-term planning



Let's face it. Democracy won't come easily to Haiti. Madonna will never be named NOW's Woman of the Year. And long-term IS planning has become a futile exercise.

This may shock those who can't imagine managing without formal, detailed, five-year IS strategic plans. How else can you intelligently build a technology infrastructure?

Trouble is, long-term IS planning usually comes up as short and disappointing as the '94 baseball season.

"The five-year planning process won't work anymore," says Bruce J. Rogow, a veteran IS consultant in Marblehead, Mass., with a strong grasp of the field's harrowing complexities. "Typically, people put together a five-year plan, then get two years into it and watch it disintegrate. Now if they put together a five-year plan, it disintegrates in six months."

Are there exceptions? Of course there are. But in general, long-term planning is a waste of time and energy, and it can even cost CIOs their jobs.

Why doesn't it work anymore? The most obvious reason: Too much is changing too fast.

"If I try to sit here with my senior leaders of the IS community and come up with a five- or 10-year action plan, the business dynamics of our industry and market will quickly negate those actions out in several years," says Dan McNicholl, an ex-strategic planner who is now vice president of IS at Whirlpool.

Organizations and technology are changing just as unpredictably. The information technology world has veered off the well-trod path of host-based computing and plunged into the unexplored thickets of client/server computing, workgroup programs such as Lotus Notes, E-mail and the Internet. Meanwhile, companies are re-engineering, downsizing and flattening, and experimenting with teams, total quality management and dozens of new managerial practices. And general management no longer has the patience to wait for long-term payoffs from long-term investments.

> There's a difference between the impossible dream of planning the future and the performable task of getting ready to exploit the future

"Gartner Group has the 3/24 rule. It says that virtually no technology solution will be competitive after three years. But at the same time, businesses want an economic return [on technology investments] in 24 months," Rogow says.

It's easier to perform brain surgery in a roller coaster than conduct long-term planning in this mercurial business environment.

Why plans fail

There's another reason five-year plans fall flat: They lead IS executives to mistake business plans for business objectives, according to Cornell University's Alan Merten, who as a specimen of that rare species — a business school dean with an IS background — speaks regularly with both CEOs and CIOs. "You will miss the corporate objectives. You will be in perpetual catch-up mode," he says.

Most companies have specific business objectives — such as to increase sales 20% or expand into Latin America — but far fewer have a detailed corporate plan that lays out the path. CIOs, believing they need a concrete business plan in order to do their technology planning, latch on to division-level plans instead.

That can turn you into an ex-CIO, Merten says. "You will be building systems to meet someone's plan," but you won't be providing your own ideas for attaining those corporate objectives.

"We used to define success by how responsive we were to what people wanted us to do. Now people are saying, 'It's not enough to be responsive. You have to think of things I didn't even ask you to do,'" Merten says.

But if detailed long-term planning isn't the answer, how do you establish long-term IS needs?

First, recognize the difference between the impossible dream of planning the future and the performable task of getting ready to exploit the future.

"Too much strategic planning is an attempt to predict the future. We should be in the business of trying to prepare for the future," Merten says.

"You have to look over a long-term horizon, but you can't have a detailed action plan that goes out five to 10 years" in a changing world, McNicholl says. Instead, managers should apply these insights to make a short-term action plan that will have a positive impact far into the future. "Strategy is made up of tough key decisions to make in the next six to 12 months that will cast a long shadow."

That's the second step: Create a plan to meet corporate objectives during the next one to three years, while preparing the company to exploit longer-term trends. "To plan is to say, 'I don't know what 1998 will look like, but I better have the following infrastructure in place so I can operate in 1998,'" Merten says. This requires that CIOs be clear on their companies' real business objectives.

As you start working toward creating that technical infrastructure, stay flexible, Rogow advises. Build a technical architecture that allows you to build and discard applications quickly and hook them together over time as needed. "This generation of systems will be built in pieces," he says.

And if your company has no corporate "plan," don't sit on your hands. Instead, take Merten's advice: "Follow the Nike plan: Just do it!"

Alter is a *Computerworld* senior editor, management.

Calendar

OCT. 23-29

1994 NPES Annual Conference. Boca Raton, Fla., Oct. 23-26 — Keynote: "U.S. Foreign Policy and Global Affairs" by U.S. Secretary of State Lawrence S. Eagleburger. Contact: The Association for Suppliers of Printing and Publishing Technologies (formerly the National Printing Equipment & Supply Association), Reston, Va. (703) 265-7200.

International Customer Service Association (ICSA) 14th Annual Conference: Customer Service — Your Golden Gate to Success. San Francisco, Oct. 23-26 — Contact: ICSA, Chicago, Ill. (312) 321-6800.

Information Technology Economics: Business Value & Profit Maximization. Tucson, Ariz., Oct. 23-26 — Conference will explore business value and profit maximization. Participants will look at a variety of industries to understand why and how they are repositioning their outlooks to better measure the value of information technology and its impact on the enterprise. Keynote: "The Future of the Corporation" by Peter F. Drucker. Fees: IS practitioners/executives, $1,395; government/military personnel, $1,695; sales/marketing/consulting professionals, $5,000. Contact: CIO Publishing, Inc., Framingham, Mass. (508) 872-8200.

Share Fall 1994 Meeting. Dallas, Oct. 23-26 — Contact: Share, Chicago, Ill. (312) 822-0932.

OOPSLA '94. Portland, Ore., Oct. 23-27 — Focus on object-oriented programming systems, languages and applications (OOPSLA). Conference sponsored by the Association for Computing Machinery (ACM) and the Special Interest Group on Programming Languages. Topics include introductions to object technology; object analysis and design management and engineering issues; object languages; formal object methods; and advanced topics. Cost: $300 for ACM members and $380 for nonmembers. Contact: ACM, New York, N.Y. (212) 626-0500.

Accounting Systems: The Next Generation. Anaheim, Calif., Oct. 24-25 — Presentation on the future of automated accounting software. Features general information sessions on the first day, product demonstrations on the second day. Cost: $350 for one day, $650 for two days. Contact: Newport Consulting Group, Torrance, Calif. (310) 366-1300.

Electronic Document Management in Insurance. New York, Oct. 24-25 — Topics include the relationship between re-engineering and imaging; improving customer service; workflow automation; making the business case; integrating imaging and workflow with your existing environment; and successfully managing the implementation process. Contact: AIC Conferences, New York, N.Y. (212) 952-1819.

Advanced Procurement Strategies: The Art of High-Tech Acquisitions. San Francisco, Oct. 24-26 — Theme: Doing better deals with your vendor. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

Client Solutions '94. Toronto, Oct. 24-26 — Seven interrelated conferences covering client/server computing issues, including client/server tools and application development; help desk issues; relational databases and servers; multimedia; imaging and text retrieval; data warehousing; object-oriented technologies; and integrating distributed data. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-1992.

HRMS/Expo 94. San Jose, Calif., Oct. 24-26 — The National Human Resources Information Technology Exposition and Conference. This conference is designed exclusively for information systems professionals, human resource management systems administrators, financial managers and human resources executives. Contact: Blenheim NDN, Inc., Mountain View, Calif. (800) 232-3976.

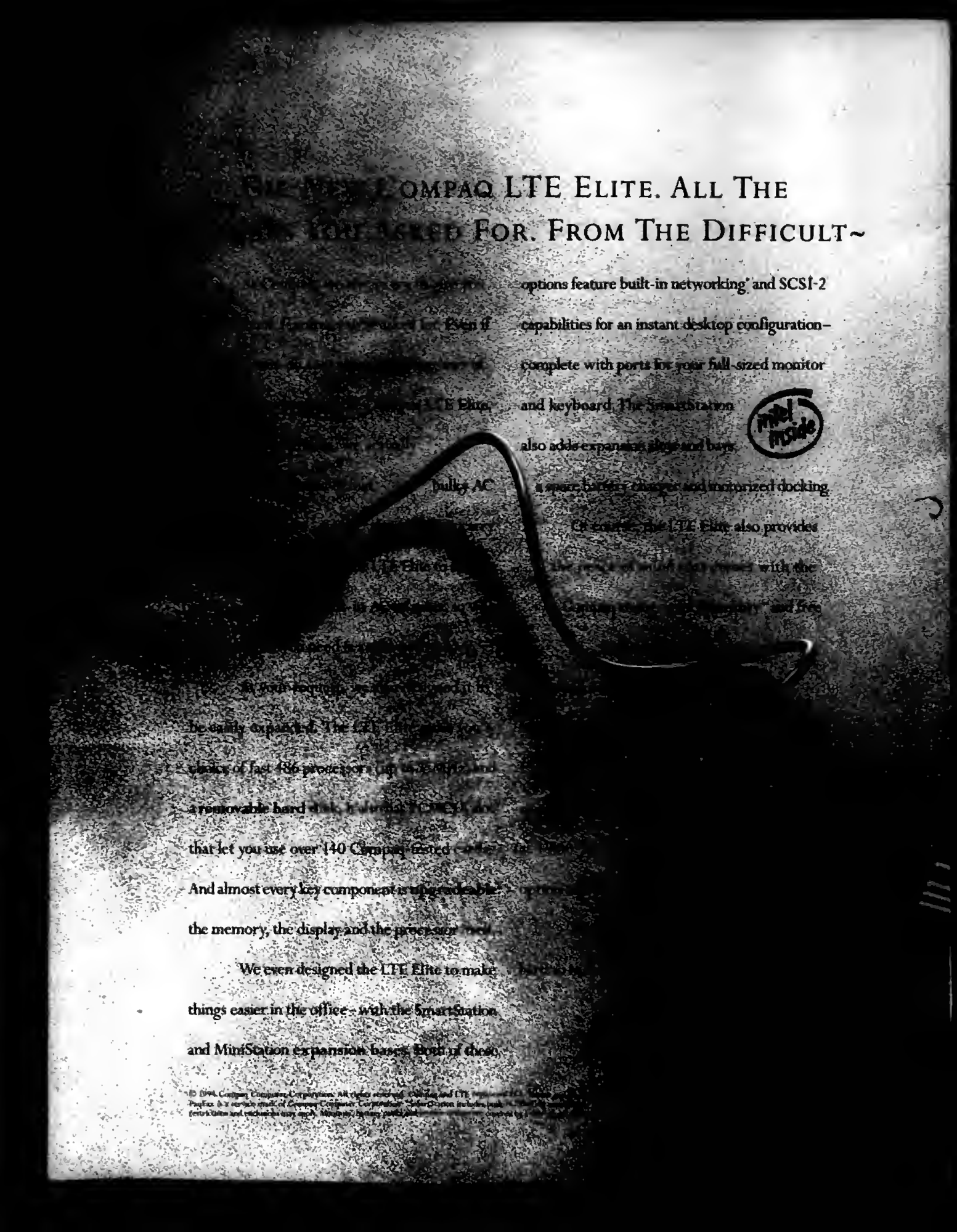
Telecommute '94. San Francisco, Oct. 25-27 — Key issues include whether telecommuting makes sense for your operation, selecting the right people to telecommute; supervising telecommuters and monitoring their performance; keeping telecommuters involved and informed; and choosing the right technology and making it work. Contact: Telecommute '94, Annapolis, Md. (410) 267-0966.

8th Annual Technology & Learning Conference. Dallas, Oct. 25-28 — Contact: National School Boards Association-Institute for the Transfer of Technology to Education, Alexandria, Va. (703) 838-6722.

From Form to Function Symposium. Edison, N.J., Oct. 27 — Symposium covers electronic forms design and solutions, paper to electronic forms design and forms, workflow enhancement technologies and imaging systems with forms automation. Contact: Spectrum Data Products, Inc., Parlin, N.J. (908) 727-1112, ext. 9.

Straight Talk about ISO 9000 Conference. Los Angeles, Oct. 27-28 — Contact: American Society for Quality Control, Milwaukee, Wis. (414) 272-8575.

The Society of Telecommunications Consultants (STC) 1994 Fall Conference. Las Vegas, Oct. 27-30 — Conference focuses on the evolution of the voice and data disciplines into the integrated information services of tomorrow. Contact: STC headquarters, Boca Raton, Fla. (407) 852-7071.


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Intelligence Files

Back-to-the-wall BPR

Desperate times call for desperate measures. So it is that European companies that have had the greatest success with radical business process re-engineering (BPR) are often the ones facing tough financial times, often on the brink of bankruptcy. The more financially troubled the organization, the more radical the re-engineering effort.

That is the finding of a report by Datamonitor, a London-based strategic management consultancy. Datamonitor examined the growing market for BPR in the UK and Europe and its effect on information systems organizations. The market for BPR is growing at a rate of 20% annually, the report said.

Datamonitor found that the depth of change in BPR means there is no one way to reorganize a company. Also, because of the amount of effort that must go into the design stage of the process and because the process involves changing so many plans at the implementation stage, the cost of BPR can be very high. That is often followed by downsizing in the IS organization and the expectation that IS will be able to provide a system that can better support business processes.

Only time will tell

Meanwhile, just how worthwhile business process re-engineering (BPR) will be for the growing market in the U.S. remains unclear. In a separate study recently, nearly half the companies surveyed that are re-engineering their business processes said it is too early to tell if it is working. Twenty-five percent said their company's efforts have been successful, 3% said the efforts have failed, and 27% gave no answer.

The survey, conducted by the Institute of Management Accountants, polled 2,200 members of the Controllers Council of the institute. Of the survey respondents, 60% said their companies are re-engineering their business processes.

Improving productivity, key business processes and internal/external customer satisfaction were given as the top reasons for implementing BPR. Other reasons included the ability to downsize and undertake significant software and hardware development projects.

The client/server payoff

A majority of companies that have made the move to client/server report big savings on their systems, and most IS managers are very satisfied with the impact of rightsizing on the cost of computing.

Those are some of the findings of a study by The Business Research Group in Newton, Mass., which surveyed 305 IS managers who are moving to client/server setups. The survey found that on average, client/server systems cost 8% less than original mainframe systems. More than half the survey respondents reported saving an average of 29% on their new systems, 6% have seen no cost difference, and 19% reported higher costs. Seventy-two percent of the respondents are satisfied with their move to client/server, while only 4% said they were dissatisfied; 22% said they are neutral about the move.

Go East, young man

The U.S. Commerce Department is looking for a few good engineers who like travel and foreign culture and have a thirst to learn new ways to do business. Applicants must be from U.S. manufacturing companies and be willing to spend time working in Japanese companies to learn about that country's manufacturing technology.

The effort is part of the Manufacturing Technology Fellowship program aimed at promoting long-term professional exchanges with Japan. Applications are being accepted for the 1995 program.

Participants in this year's program include 40 engineers from 23 U.S. companies, including General Motors Corp. and AT&T Corp. They received language and cultural training at Vanderbilt University.

They leave for Japan this month and start their assignments in November.

Applications for next year's program must be submitted by March 1, 1995. For information, contact the U.S./Japan Technology Program, Room 4226, U.S. Department of Commerce, 14th St. and Constitution Ave. N.W., Washington, D.C. 20230, telephone (202) 482-0356, fax (202) 219-3310, or E-mail to MTF_USOTP@banyan.doc.gov.

IS center opens

A Center for Information Technology & Management has opened at the Haas School of Business at the University of California at Berkeley. The center was organized by the information technology management faculty at the school and works with an advisory board of company leaders in information management strategy. Its mission is to develop and share information on the impact and potential of information technology on companies, with an emphasis on the business implications of the information superhighway.

The center is also sponsoring a series of seminars on IS topics, including a November seminar on "Outsourcing, Cosourcing and Insourcing," featuring as keynote speaker Victor Millar, president of Unisys Worldwide Information Systems. For information, contact David Irons at the Haas School of Business, Berkeley, Calif. 94720-1900, (510) 642-2734.



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Steven A. Mills, General Manager of IBM Software Solutions, will explore the topic, *"Objects: Not Just for Programmers Anymore."* He'll discuss how objects have become the driving force in the way software is developed, purchased, delivered, and maintained.

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Caterpillar Inc., one of the largest buyers of steel in the U.S., developed a client/server application using object-oriented analysis and design techniques to ensure that forge shop suppliers have enough steel on hand to produce over three thousand forging parts —when they're needed.

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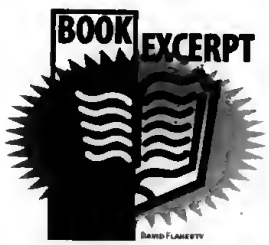
Here's the real story behind the development of Windows NT — the most complicated of all PC software programs. The following three passages are excerpted from:

SHOW-STOPPER!

The Breakneck Race to Create Windows NT and the Next Generation at Microsoft

By G. Pascal Zachary

"The Day Has Soured Early"



DAVID N. CUTLER, wearing white Reeboks, white pants and a T-shirt bearing the legend "Over the line," bursts into the Build Lab and takes stock of the largest, most complex program ever created for a personal computer.

It is 10:20 in the morning, and the latest "build" of the program, called Windows NT, is hours late. Cutler, the leader of the team making NT, is angry about the delay, angry about a botched test the day before, angry at the world. He knows that nothing slows progress more than a steady accumulation of small lapses, and he is bent on pushing ahead.

Cutler insists on frequent builds, or samples, of NT so his 250 programmers can "eat their own dog food." It is a frustrating experience, not unlike building a house from scratch while living in it. The sooner a build arrives, the sooner his team will test their latest creation, discover its imperfections and improve it.

Scowling, Cutler now slumps into a swivel chair and glares at the computer screen before him. He hits a few keys and groans.

Cutler's unhappiness is contagious. Three builders, who stitch together NT with the aid of computers, hover behind Cutler, busying themselves while he churns. One, a shoeless and jittery young man, juggles three rubber balls. He is surrounded by dozens of computers. The voice of Aretha Franklin, romping through "Dr. Feelgood," fills the room from the stereo speakers mounted on the wall.

No fan of juggling or Aretha, Cutler growls. He jumps to his feet, flinging the chair behind him, and storms out of the lab. The shoeless juggler and chief builder dip into a big jar of Rolaids, popping one each. The day has soured early.

... [Later,] his face reddening even more, Cutler leaves again, steaming. His rough creed forbids him from containing his emotions. "The way you let off stress is to let it out," he says. He isn't too particular about how he does it. A circle drawn on the wall near the door marks the spot where he once unleashed a violent kick, cracking his toe. Just the other day, he smashed a wall with his fist, which ordinarily would not have caused a stir except that this time he hit a stud and broke a finger.

Cutler's impatience is ill-mannered but understandable. Time means everything to him now. He is a year behind schedule, and after years of work, his team is tired and frustrated. Only the enormity of their goal sustains them now. The 250

Showstopper, *page 106*

SHOWSTOPPER

CONTINUED FROM PAGE 105

members of the team aim to produce a computer program so powerful and versatile that someday everyone will need it. Standing in their way are thousands of hugs, or coding errors, and persistent doubts about the basic design of NT, which stands for New Technology.

"A Gulf Between Gates and Cutler"

WITH THE PROJECT more than 2 years old and NT assuming what appeared to be its final shape, [Microsoft Chairman Bill] Gates now cast his gaze elsewhere. He hardly ever spoke with Cutler anymore; they almost never exchanged E-mail either. This is partly Gates' way of paying Cutler a compliment. Most Microsoft projects lacked leaders of Cutler's caliber; Gates was breathing down those guys' necks. He felt he couldn't offer Cutler much help. "My ability to add value to a project that Cutler's running is a lot less than some other Microsoft projects," he said.



David Cutler

There existed a gulf between Gates and Cutler that neither wished to measure. Theirs was an ambiguous relationship, but it worked best that way. They were allies but not friends, partners but not collaborators. Cutler toiled within the confines of Gates' domain but had carved out a separate realm for himself. His allegiance to Gates was rarely tested and never questioned. This arrangement bore fruit but little warmth. Gates sometimes acted as if he thought Cutler was a know-it-all who dismissed his advice and achievements too readily. He eschewed casual conversations with Cutler because he felt "always a little leery about saying the wrong thing" to him. Cutler, meanwhile, saw Gates as someone who could tell him "what he was signed up to do." While he wanted Gates' approval, Cutler didn't look to him for advice and succor.

Even during periodic reviews of NT's progress, there was little chance for Cutler and Gates to speak privately. Maritz, Perazzoli and other [members of the development team] attended these meetings, which had the air of a performance. "They were never spontaneous," Perazzoli said. "There were tons of slides, and we always had a demo. We always showed Bill something so he'd know there was progress and that we were spending his money wisely."

Rather than express their frustrations to Gates, Cutler and Perazzoli preferred instead to complain to Maritz or Balmer. "That's how we wanted it to be," Perazzoli said. "Bill's too powerful. You don't want to expose yourself. If he doesn't like what you are doing, he'll tell you no. Then there's no recourse."

"Time To Ship This Thing"

BILL GATES entered the conference room off the lobby near his office and sat down at the head of a long, narrow table. Maritz sat closest to him. He was joined by the senior leaders of the project: Cutler, Dunie, Perazzoli, Thompson, Pederson. A few others waited in the wings.

It was Dec. 16, 1992, nearly six months since Gates had last assayed the project's health. Everyone was anxious and wished for a flawless presentation. "A BillG review is an extremely motivating factor," Dunie said. The team knew the consequences of appearing unprepared (or worse, ignorant). Gates often took special delight in punching holes in others' ideas. Sometimes, he felt sufficient disgust to throw away a team's work because it fell short of his goals. The company's first database program, under development for more than two years, had recently been shelved at Gates' behest.

No one in the room thought Gates would spike NT. If anything, Microsoft's chief was eager to see the program in customers' hands. This, however, hardly meant he would signal the program's last lap. Maritz had told them that Gates still had reservations about the size and speed of NT. The thrust of the meeting was to allay Gates' "too big, too slow" worries. It would not be easy. Gates had harbored such doubts about NT for more than two years. The risk now was that he'd insist that the team write new code to improve performance. This would delay the completion of NT for months and, as Dunie noted, "could introduce errors into it and sacrifice robustness."

Gates arrived at the meeting certain of his ultimate intentions. He wanted "to ship this thing." NT was crucial to the company's future; the program was its best defense against rivals and the foundation for giving PC owners the kind of security and reliability now offered only with much more expensive computers. Moreover, NT was a big step toward the ultimate piece of software: a program that could run any application on any machine. To launch this new age in computing, Gates was willing to compromise. Indeed, he'd ceded his hope that NT would run well on a PC with just 8M bytes of memory. It now appeared that 16M bytes was probably the minimum that a PC needed in order for NT to perform adequately. Neither Cutler nor Perazzoli had the gumption to tell Gates flatly the bad news on memory, but over the summer he had gleaned the truth from Maritz.

The performance of NT was another matter. Gates would not compromise on that. If he did, customers would kill him. That Gates worried about customers seemed to surprise many people. Lately, he had come under fire for being a dictator who imposed standards on the computer industry that benefited Microsoft's diverse product line while driving competitors to the brink of annihilation.

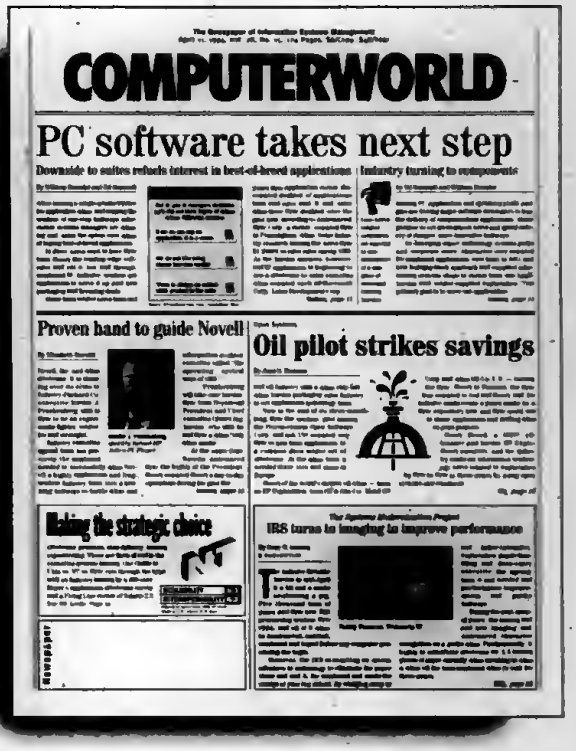
... Just a few years earlier, he had been celebrated as the scrappy entrepreneur who courageously carved a thriving business from the technological wilderness ignored by entrenched powers. Now he was a maligned bully who wanted to own the entire software universe, a greedy man who thumbed his nose at both customers and competitors.

Which was the real Bill Gates? The richest American by virtue of his roughly $7 billion in Microsoft stock, Gates was an object of envy and awe, paranoia and adulation. These strong emotions made a balanced assessment of his actions impossible. Anyway, the choice between saint and sinner was no illusion; these were cartoon images of Gates. The real Gates resembled a big-city political boss, more Richard Daley than Rockefeller. This was because his power depended on both exploiting and nurturing a chain of dependents, everyone from applications writers to PC makers to customers. So it was with NT. ■

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Computer Careers

Multimedia

The technology will touch just about every job in the information systems department, experts predict. In particular, IS managers, database designers and support staff will be the first to get their feet wet.

By David A. Kelly

While most users deal with text-type information, Bruce Goedde, multimedia analyst at L. H. Alton and Co. in San Francisco, envisions companies moving toward a variety of data types. Video mail, video database systems for sales support, integrated voice and telephone support and videoconferencing will eventually become common. In fact, experts predict the following four information -systems positions will be among the early learners:

IS managers

"You would do your career a favor in understanding the demands of multimedia on your network," says Gary Schultz, principal analyst at Multimedia Research Group in Sunnyvale, Calif.

Unlike text-type data, audio and video data are time-dependent. When a network slows down today, it takes longer to retrieve data. But a slowdown on a multimedia network will cause video or andio clips to become garbled, jerky or unintelligible. Besides knowing the hardware and software requirements needed to deliver multimedia, IS managers should examine file server architecture, uetwork protocols and network hardware for bottleoecks in handling throughput-intensive data types.

System integrators

"There is a real big opportunity for systems and network integration specialists," says Tim Tevlin, husiness development director at Digital Renaissance in Toronto. They must understand the demand multimedia places on computers, networks and servers and become familiar with different video compression techniques and the trade-offs between quality, storage space and speed.

In addition, systems integrators should explore physical uetwork solutions such as switched Ethernet hubs that allow each connectiou to have the full bandwidth available for supporting video.

IS support

Basic tools such as spreadsheets and word processors will begin to incorporate multimedia books or modules. For example, Windows users can embed a sound clip into a spreadsheet or document by using Microsoft Corp.'s Object Linking and Embedding capabilities.

"Attaching some type of dynamic data such as a video, animation or voice clip to your work will become commouplace," Schultz says. As it does, IS support people must be ready. Acquire practical experieuce with oew multimedia-aware products.

WHO NEEDS IT?

Database designers/developers

Many companies will be integrating video, animatioo or graphics into database applicatious. For example, companies might use multimedia to bring their sales database to life by adding video or audio clips of a product in use to show to clients.

"Programmers who understand multimedia database products and their capabilities will be ahead of the game," says Alan Simon, author of *Strategic Database Technology*, published by Morgan Kaufmann. Simou suggests looking at existing databases to understand what multimedia they can and cannot support and how to work around the limitations of specific databases.

But whatever job you do, feeling comfortable with multimedia doesn't mean you must become an expert. "Multimedia is a sea that you're in, but you don't need to become a sailor. You can become a specialist in boats, in plankton, tide or whatever interests you," says Will Strauss, president of Forward Concepts Co. in Tempe, Ariz. "You don't oeed to learn it all." ■

Kelly is a free-lance writer in Newton, Mass.

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while the iron is

Demand for object-oriented know-how will be short-lived, some analysts predict, as traditional programmers learn the technology. The big opportunity long term is in large-scale object database experience.

By Alan Radding

Though Columbus proved the world is round more than 500 years ago, relational database professionals still view the world as flat. For them, object databases come as a revelation.

"When you're well-trained in relational modeling, you begin to believe the world is two dimensional. You think you can get anything into the rows and columns of a table," observes Douglas Barry, principal of Barry & Associates, Inc. in Burnsville, Minn., and executive director of the Object Database Management Group (ODMG). Back in the late 1980s, Barry thought just that.

Then someone threw him a problem involving a parts explosion like you find in a manufacturing bill of materials. It took work, but Barry fit it into the two-dimensional world of relational tables. "When I saw it done as an object database, it ran 100 times faster," he recalls. He's been a believer ever since.

As the object database story spreads, the market for that technology is exploding. International Data Corp. in Framingham, Mass., projects growth will more than double in the next few years, however the market remains very small compared with the relational database world.

The demand for object skills is high, but information systems recruiters aren't pushing object database positions because of the small market. But you will find jobs posted in on-line forums such as comp.databases.object on Usenet.

Because there's been limited exposure to object databases, companies "don't know where to get the talent," says Dean Mackie, a developer at Discis Knowledge Research, Inc. in Toronto. For now, companies approach people at organizations that already use the technology, says Mackie, who is solicited regularly.

"People are calling me out of the blue. I've never sent out a resume," says Norm Green, senior associate software engineer at a major Toronto manufacturer.

Green says demand will be relatively short-lived, however, as traditional programmers learn the technology and flood the market. The big opportunity in the long term is with large-scale object databases.

In demand

Industries experiencing the biggest demand for such skills are telecommunications, financial services, particularly investment and trading, and process control manufacturing, reports Patrick O'Brien, director of product management at Object Design, Inc. in Burlington, Mass.

Despite the enthusiasm for object databases, the triple-digit annual growth and demand for people with any object experience, don't neglect your relational database skills. Relational database technology is not going away.

Object databases work well with time series data, images and other complex data types while relational databases work best with data that maps directly to rows and columns, notes Drew Wade, founder of Objectivity, Inc. in Mountain View, Calif.

Eventually, companies are expected to have relational and object databases side by side, each used for what it does best. ■

Radding is a free-lance writer in Newton, Mass.

Changing roles

Object databases will change some of the roles of relational database professionals while leaving others essentially intact.

SQL programmer

This position will probably go away, although there are efforts to create object extensions to the SQL query language. In object databases, the user currently queries the database using an object language. The ODMG has already defined an object query language in its ODMG-93 object database specification and intends to make it compatible with whatever ANSI SQL object extensions emerge in 1997.

Database administrator

This job continues, but it will change. Instead of working with tables, rows and columns, the database administrator will work with objects and have more flexibility and opportunity for creativity because objects are a more natural kind of component. The database administrator will continue to be concerned with tuning, load balancing and indexing.

Data modeler

This job remains. Even in the object world, organizations still need to understand their data flows and relationships.

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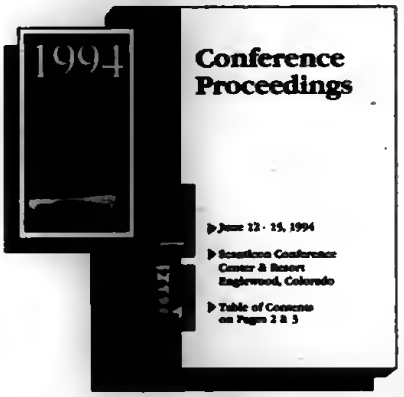
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Famous Footwear, a 700-store chain with a 33-year history, is currently experiencing phenomenal growth, ensuring our presence in the world of retail for many years to come. We are seeking talented and experienced Information Services professionals to join our exciting, dynamic company. We provide the opportunity to take a leadership role in a team environment, utilizing the latest technology to help advance our company's business objectives.

As a ***Systems Analyst***, you will develop system scopes and objectives on medium and large projects. Working closely with the customer, you will determine business requirements, then analyze and develop project proposals. Other responsibilities include providing technical guidance to programming and applications to others, coordinating systems testing, and estimating, preparing and maintaining project schedules. We prefer experience with C, Unix, Oracle 7, PL/SQL and SQL Forms. Prior leadership experience in a team environment is necessary.

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The individuals we seek will possess a bachelor's degree, minimum 5 years experience, excellent written and oral communications skills. Previous VAX/VMS and/or Oracle experience beneficial.

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SOFTWARE ENGINEER - Analyze, design, prototype and implement an Access Control and User Resolution Facility to solve resolution of hardware and software problems in PC and minicomputer environments. Design hardware/software interface using VAX 11/780, PC's, R6/6000 and C, FORTRAN. Train staff in resolving typical hardware configuration issues. Design and implement a communications network by integrating hardware, software and communications components. Req'd: Master's Degree in Engineering or Computer Science. Must have one (1) semester graduate level courses in: Computer Communication Network Theory, Analog or Digital Communication Theory, Circuit (VLSI) Design, and undergraduate courses in Network Analyses, Digital Circuit Theory. 40 hrs/wk, 8 am - 5 pm; $38,130.50/YR. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #108894. Employer pd. ad.

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- MICROFOCUS COBOL, ADW
- UNIX, C, INFORMIX
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At our Bureau of Information Systems, we support the human service programs of Wisconsin's Department of Health and Social Services. Our environment encompasses large system, client-server and LANS/WANs utilizing Windows development and CASE tools. Continued growth has created new opportunities in all of these environments for the following:

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Our hometown is beautiful Madison, Wisconsin a thriving city of 200,000. Madison is ideally situated on an isthmus, surrounded by five breathtaking lakes. This All-American City was ranked #2 in Money Magazine's "Best Places to Live" in 1995 and offers outstanding schools and housing.

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PROGRAMMER ANALYST (Ref. 104694) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs; analyze, design, develop & implement computer software for clients' EDP systems; design, develop, test, implement & maintain an integrated welfare system through on-line & batch programs; process flow & data design, data modeling identification, technical support & overall design of application every part of system, & meet with users to gather requirements implement welfare system in various offices; technical support for design of applications using UNISYS 2000, UNISYS PCs-486, MAPPER 3(R)1, ECL, COBOL, WINDOWS, BRACKETS, MSWORD, EXCEL & POWERPOINT. Reqs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electronic or Electrical Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, or Computer Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, design & development of computer software using MAPPER-C. Related experience must also include, in whole or in part, use of UNIX & IBM platforms, UNISYS 2000, ECL, COBOL & WINDOWS. $43,500/yr. 40 hrs/wk., 8:30a-5p.

PROGRAMMER ANALYST (Ref. 104794) to consult with clients to ascertain & define business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; customize an Inventory Forecasting & Management package; develop software enhance & customize package in a MVS-OS/2 client server environment, including redesigning of its modules, database modifications & system testing, using OS/2 on PS/1 machines with Communications Manager, NTS/2 & Presentation Manager, C, DB2/2 (OS/2), APPC. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, coding MVS-OS/2 client server application using Presentation Manager, C, DB2/2, APPC. $40,000/yr. 40 hrs/wk., 8:30a-5p. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

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SITEL Corporation, a leader in the telemarketing industry, is looking for experienced "C" programmers for its Inbound Division.

A Strong working knowledge of at least one Relational DBMS and 2 to 3 years programming experience in "C" are required. Working experience with Tandem Non-Stop SQL and Pathway, telemarketing industry knowledge/experience, and a strong telecommunications background will be significant advantages. Candidates should have an computer sciences and formal training and/or practical experience in software engineering methods are strongly preferred.

Title and pay will be commensurate with years of experience and education. SITEL offers a competitive pay and benefits package including a 401(k) plan, vacation, sick, and holiday pay; medical and dental benefits, and life insurance.

To schedule an initial telephone interview (evening interviews are possible), please fax or mail your resume along with a day-time phone number to:

SITEL Corporation
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Director of Information Systems

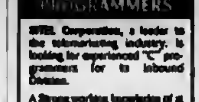
SITEL Corporation, a leader in the telemarketing industry, is looking for an experienced Director of Information Systems for our Marketing Services Group. This Service Group is in a rapid growth phase, and many systems need to be developed.

The Director of Information Systems reports to the General Manager of the Service Group. Responsibilities include directing and coordinating the development and production activities of the department, determining the boundaries and priorities of new projects, systems capacity, and equipment requirements; supervising the operation of the division's voice and data systems; supervising, evaluating, and directing the work of the department's employees; participating in strategic and financial planning; communicating with various telecom, data processing, and software vendors; overseeing systems engineering; explaining the company's systems to potential and existing Fortune 500 clients; and maintaining systems security and operations.

To successfully perform the essential functions of this position, the incumbent must have a bachelor's degree in computer sciences and at least five years in systems management or information technologies experience. Experience with voice and data telephone and switching systems is required. In addition, knowledge in systems design, programming, and data processing operations, and PC hardware and software is required. A good working knowledge of Tandem, Datapoint, LAN and WAN environments and protocols is also helpful.

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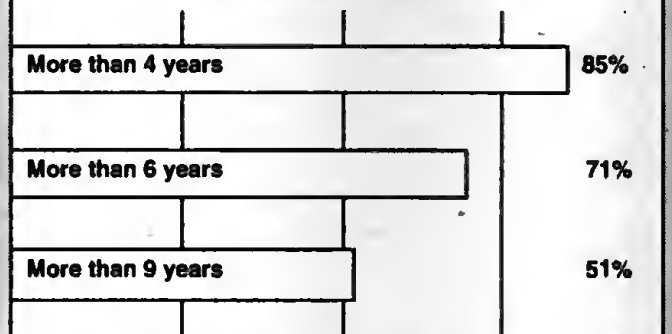
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Design, develop, implement and maintain in-house clinical applications as the liaison between third-party vendors and end users. The successful candidate will provide analytical and technical guidance to clients, create systems development life cycle documents, and support applications on a 24 x 7-basis depending on need. Additional duties may include recording meeting minutes and securing agreements on timelines and responsibilities.

Our ideal candidate must understand relational database concepts (Oracle experience preferred), and possess other languages (C, DCL; Oracle SQL forms) SQR; and VAX/VMS experience. UNIX and/or client/server helpful along with PC or Macintosh environments. Must be able to learn business skills quickly, have excellent communication/interpersonal skills and at least 2 years' application development experience.

Senior Technical Writer/Trainer

Sole provider for all hospital computer documentation. Specifically, update, test and maintain technical documentation for end users including clinical and shrink-wrapped applications, ALL-IN-1, and the hospital information system. On occasion write for ISD newsletter, sharing editorship and research duties. Also design/implement end user training and develop guidelines/standards for publication processes, techniques and style.

Our ideal candidate will have MAC and PageMaker skills, the ability to work independently as well as with project groups, excellent interpersonal/communications skills, and the ability to translate technical data in layman's terms.

Manager - Desktop Integration Support And Computing

Manage end user desktop computing services including application development, integration, installation, operation, hardware/software evaluation, and maintenance of central-site networked desktop devices and peripheral equipment. Also manage desktop and LAN support, development activities, and oversee the diagnosis of desktop hardware, network and software problems.

Our ideal candidate must possess extensive knowledge of PCs and desktop technology, broad VAX/VMS background, and good project management skills. Systems development life cycle experience, excellent communication/ interpersonal skills and team consensus building skills also needed.

Interested candidates should send cover letter and resume, indicating position of interest, to the Human Resource Department, Children's Hospital, 300 Longwood Avenue, Boston, MA 02115. Children's Hospital is committed to diversity in the workplace.

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PROGRAMMER/ANALYST POSITION, 6240 NW 23 Street, Suite 200, Miami, FL 33166, OR APPLY IN PERSON. INTERVIEWS WILL BE SCHEDULED AND CONDUCTED BY APPOINTMENT ONLY.

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North Adams State College seeks an experienced network support person who can develop a campus-wide network and can advise faculty on computer laboratory networks. The Coordinator will perform day-to-day network management tasks including configuring, operating and maintaining network management systems; designing, implementing and updating operating procedures, and maintaining accurate event logs. The Coordinator will provide hands-on support to the campus for resolving network and data communications problems, installing equipment and assisting in the design of network and data alternatives, including advising faculty. Occasionally, this position will require working in the evenings, early mornings, on weekends or holidays. Initial responsibilities will include system management of UNIX NOVELL and DECNET network management platforms and the implementation of TCP/IP and E-mail access services. Qualifications require a Bachelor's degree, preferably in an appropriate field; knowledge of data communications; wide area and local area network concepts, methods and techniques with in-depth knowledge of the TCP/IP protocol suite, including application layer programs, DECNET and Novell Network. Minimum of three (3) years professional networking experience in a TCP/IP, NOVELL (3.xx) environment with at least one year of UNIX system management experience. Demonstrated ability to communicate well orally and in writing, especially in an academic setting. Preferred qualifications include CNE certification, knowledge of x.25 personal computer hardware and operating systems, and ability to learn from and advise faculty in the use of classroom networks.

To apply send letter of application and resume to: Personnel Office, North Adams State College, North Adams, MA 01247 by November 4, 1994. NASC is an equal opportunity/affirmative action employer and provides reasonable accommodations in the workplace. Women and minorities are encouraged to apply.

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To excel, you must have 8+ years' as a Project Manager with multiple project responsibilities involving both mainframe and PC platforms in the area of Banking or Financial Services. Technical experience and knowledge should encompass an understanding of current development techniques, data base management systems, preferably IBM's DB2, and client server techniques. Solid managerial experience involving administering client relationships, directing project teams of diverse backgrounds and coordinating administrative and budgetary functions are also essential. Strong leadership, interpersonal and communication skills are also prerequisites.

Salary is commensurate with experience and is accompanied by a flexible benefits plan including an employer-funded pension and 401(k) plan. For consideration, please send cover letter, resume and salary history to: HUMAN RESOURCES, DEPT RR, M&T BANK, ONE M&T PLAZA, 11TH FLOOR, BUFFALO, NEW YORK 14203. An equal opportunity employer M/F/D/V.

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Computer Opportunities

USAir, a recognized leader in the airline industry, seeks the following experienced computer professionals to work in **Winston-Salem, N.C.,** one of the nation's most "liveable" cities:

SR. DATABASE ADMINISTRATORS
Requires 3+ years experience in logical database design, physical database implementation and support utilizing DB2, DB2/2/6000 or ORACLE; UNIX a plus.

SR. SYSTEMS ENGINEER
Requires 3+ years working in a TPF environment, preferably in an on-line recoup area. Knowledge of internals and coding descriptors, REXX, C/3700, TPFDF and SAPR desired.

DB2/MVS/ADABAS-NATURAL SYSTEMS PROGRAMMERS
Be part of a team responsible for varied duties, including systems level support of DB2, IMS, CICS, Natural and related products or MVS and similar products.

NETWORK OPERATOR
Monitor, maintain and initiate restoration of USAir's SNA, TPF and Distributed Processing networks. Seeking 2 + years experience in a communications environment working with PC's, LANs, and associated software/hardware.

PROGRAMMER
Requires experience in COBOL II CICS/DB2 in an IBM mainframe environment; knowledge of Natural or other 4GL a plus. May consider a 4-year Computer Science degree in lieu of experience.

TPF SPECIALIST
Requires 3+ years experience in TPF with Airline Reservation Systems familiarity. Knowledge of Passenger Name Record End Transaction, Inventory and Teletype package advantageous.

USAir offers competitive salaries, relocation assistance, and excellent benefits including liberal travel privileges. Applicants should forward resumes and salary requirements, *clearly indicating position of interest,* to: **USAir, Inc., Employee Relations/IS Recruitment, 3000 N. Liberty Street, Winston-Salem, N.C. 27105.** EEO Employer. Principals only, please.

USAir

Programmer Analysts

Yale University has launched a massive reengineering program for key administrative and finance systems. Eight new positions exist for analysts skilled in application development in a client/server environment. Minimum 3 years development experience, BA/BS, and several of the following:

Development experience with RDBMS (Oracle, Sybase), SQL based tools CASE tools, UNIX server, Desktop database (Paradox, FoxPro), Desktop development tools (Mac, Windows).

Generous benefits include growth opportunities, 22 vacation days, and access to Internet and Yale facilities. Send resume and salary history to: Ms. E. Dubois, Yale University, Dept. of Human Resources, 155 Whitney Avenue, P.O. Box 208236, New Haven, CT 06520-8236.

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Senior Analyst
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This is a unique apply to join a leading, prestigious insurance company located in NEW JERSEY. In this challenging role you will assist in the planning, selection and installation of an integrated insurance applications package to run on the AS400 platform.

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This position brings with it the opportunity for advancement, and excellent salary and a full range of benefits. Qualified candidates should send resume and salary history, in confidence to: Personnel Department, 826 Lexington Avenue, New York, NY 10016.

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Systems Analyst/Programmer Analyze business procedures/problems to refine data & convert to programmable form for electronic data processing. Confer with personnel of organization involved to ascertain specific output requirements. Study existing data handling systems to evaluate effectiveness & develop new systems to improve production/workflow. Specify in detail logical/mathematical operations to be performed by various equipment units/comprehensive computer programs & operations to be performed by personnel in system. Conduct special studies/investigations pertaining to development of new information systems to meet current/project needs. Plan, prepare technical reports, memoranda, instructional manuals for establishing, functioning of complete operational systems. Prepare programs for computer use. Determine electronic data processing system to provide system capabilities required for projects/workloads, plan layout for new system installation or modification of existing system. Req: Bachelor's degree in Electronic Engineering and 2 yrs exp. $30,000/yr. 40 hrs/wk, 9-5. Submit resume to: Job Service of Florida, 2080 W Oakland Park Blvd, Ft. Lauderdale, FL 33311-1347. Re: Job Order # FL 1124152.

Programmer Analyst

BS in Computer Sciences or related discipline. ICCP Certification desired. 2 to 5 years programming experience in manufacturing or similar environment. 1 to 3 years experience in ADABAS and NATURAL programming language required. Experience with VSAM and IMS, COBOL & EZTRIEVE helpful.

Business Systems Analyst

BS in Computer Sciences or Business Administration. ICCP Certification desired: CPA, CSP, CP. Requires 8 to 10 years in systems development, primarily within large, multi-site financial systems. Requires extensive knowledge of Accounting procedures. Experience in IMS MII Series financial systems desired. Some programming required in COBOL, CICS and NATURAL.

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SENIOR SOFTWARE ENGINEER to design, develop, analyze, test, maintain and support applications system software across multiple platforms including DOS, Windows, UNIX and VMS using C++ (Visual, VAJ), MFC, PenWriter, ProActive, PVCS, ODBC API, Windows API, SDK, OLE, Client/Server techniques, TCP/IP, PC-NFS, C and Intel 80x86 Assembly; System functional and detail design using object-oriented methodologies (Rational Rose, CASE:W); Relational database management system design using WATCOM, Oracle, Informix and ODBC techniques. Require: M.S. degree in Computer Science/Engineering and four years of experience in the job offered or in programming/analysis. An additional graduate degree in computer science or computer engineering may be substituted for two years of the required experience. Salary: $45,000/year, M-F, 8 am to 5 pm. Apply in person or by resume to: Georgia Department of Labor, Job Order # GA 5776583, 2936 M.L. King Jr. Drive, Atlanta, GA 30311-1605, or the nearest Department of Labor Field Service Office.

SENIOR SOFTWARE ENGINEER to design, develop, implement, test, maintain and support applications software under VAX/VMS and UNIX platforms using INGRES (OSL, SQL, SQL, VIFRED, REPORTWRITER, ESQL), ORACLE (SQL*PLUS, SQLMENU, SQLREPORT, SQL*FORMS), INFORMIX, VISION, C, C++, ESQL/C, JAM, and Novell and Ethernet for networking and communications; the object-oriented design and analysis techniques and Client/Server techniques. Require: B.S. degree in Computer Science with four years experience in the job offered as described above or as a systems analyst. Salary: $45,000/year, M-F, 8:30 am to 5:30 pm. Apply in person or by resume to: Georgia Department of Labor, Job Order # GA 5771086, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3809, or to the nearest Department of Labor Field Service Office.

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Account Manager

Responsibilities will include providing our clients with software implementation, project management and issue resolution.

Ideal candidate will have project management & implementation experience, as well as a strong understanding of implementation methodology and customer satisfaction. Experience using project management tools and exceptional verbal and written communication skills a must. This position requires the ability and flexibility to travel and eight to ten years of related experience.

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We are seeking Software Consultants for each of the following: Materials Management, Human Resources and Finance. Responsibilities will include providing end-user classroom training and consulting services utilizing Lawson's products. Requirements include a bachelor's degree in a related field along with public speaking skills. Two to four years computerized business application systems experience on UNIX, AS400 and/or implementation skills an added plus. Excellent communication, interpersonal and problem-solving skills necessary. Overnight travel required.

UNIX Technical Service Consultant

Responsibilities include product installations, technical training and operational usage consulting to our diverse client base. Requirements include at least two to three years UNIX operating system administration experience along with installations and/or implementation background. Excellent communication, interpersonal, verbal and presentation skills essential. Experience with consulting/training a plus. Knowledge of Sybase or Oracle databases preferred. Overnight/out-of-town travel required.

We offer a competitive salary, comprehensive benefits and an opportunity to work in a quality-focused team environment. Please submit resumes (specifying position for which you are applying), which must include salary requirements, to: **Sr. Human Resources Generalist, 1300 Godward Street, Minneapolis, MN 55413.** EOE.

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Database Administration

(Data Management)

You'll develop stored procedures and triggers, install and tune Oracle, design and create tables according to logical models, and administer Oracle database security. In addition, you'll be expected to formulate physical database design and participate in database loading, unloading, backups, restores and disaster planning.

To qualify, you'll need 2+ years' experience with Oracle Relational DBMS (7.0 preferred), strong SQL expertise, and superior skill with database installation and tuning. A working knowledge of UNIX, its kernel parameters, and how they affect database engine performance is essential.

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(Technical Services)

In this key position, you'll provide second-level support for the Teradata DBC/1012 database, support Applications Development with technical guidance, on the structure and use of the database, perform database monitoring, and ensure that databases are recoverable.

Two plus years supporting Teradata DBC/1012 is essential in this position as is familiarity with performance tools and structuring of databases for performance and reliability.

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(Technical Services)

Responsibilities include providing UNIX support to our Operations and Development organizations, developing shell scripts, and creating installation guidelines. In addition, you'll work with internal and third-party support staffs to resolve problems, and monitor the performance of UNIX production and test systems.

To qualify, you should have 3+ years of UNIX technical experience and a solid background in internals, performance and tuning. Strong knowledge of WIN TCP/IP, Relational DBMS, and SQL also is required.

We offer an attractive salary, outstanding benefits, a stable, supportive environment that encourages professional development, and every chance to advance as far as your ambition and abilities will allow. For immediate consideration, please mail or fax your resume, in confidence, to: **Mr. Ed Bales, Human Resources Department, CW-103, AT&T Global Information Solutions, 1700 S. Patterson Blvd., WHQ-2, Dayton, OH 45479. Fax (513) 445-1330.** As an equal opportunity employer, we value diversity.

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SOFTWARE ENGINEER: 40 hrs/wk, 8 a.m. - 5 p.m., $45,800/yr. Analyze, design, develop and test industrial and manufacturing computer software applications and network systems on UNIX and VMS platforms utilizing C, INFORMIX, TCP/IP, MOTIF, INGRES and RDBS. Develop systems architecture, implementation plans, internal design test plans and test data. Requires Bachelor's Degree in Computer Science, Electrical Engineering, or Mechanical Engineering. Requ 3 yrs. exprr in job offered, or 3 yrs exprr as Systems Analyst/Programmer/Manager/Engineer. Requ work exprr in design and development of s/w systems on UNIX and VMS platforms utilizing C, INFORMIX, TCP/IP, MOTIF, INGRES and RDBS. "Employer paid ad" E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 815, Detroit, MI 48202. Ref No: 108884.

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- Ability to tune the system using the tools above to meet existing service levels, and/or ability to advise management on establishing service levels.
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Applications Programmer (Houston, TX area client site). Design, develop, code, test, and maintain programs for commercial and financial applications systems, using COBOL II in an IBM MVS mainframe environment. Development work must additionally include programming experience using either DB2 or IMS database for IBM mainframe systems. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. In job req. 40 hrs/wk, 8:30-5, $36,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778. J.O #TX7211750. Ad Paid by an Equal Opportunity Employer

PROGRAMMER ANALYST: 40 hrs./wk., 8am-5pm, $40,500/yr. Carry out the technical design, coding and testing of software application system on IBM 3090 mainframe computer utilizing MVS, DB2, CICS & COBOL II environment. Perform user training. Require Bachelor's degree in Computer Science, Electrical Engineering or Mathematics, 2 yrs exper in job offered or 2 yrs exper as Programmer/Analyst. Work experience in developing software systems on IBM 3090 or ES9000 mainframes utilizing COBOL II, CICS and DB2. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref No: 114994

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Programmer/Analyst (Houston, TX area client site). Analyze, design, develop, code, test, maintain and document programs for commercial and financial applications systems, using RPG in an IBM mid-range environment. Bachelor's degree in Comp. Sci., Math, Engin., or Bus. Admin., and 1 yr. exp. in job req. Will accept 3 years of experience in lieu of Bachelor's degree and 1 yr. exp. Development work must include at least 1 year of RPG/400 programming experience on the AS/400. 40 hrs/wk, 8:30-5, $37,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778. J.O #TX7211739 Ad Paid by an Equal Opportunity Employer

PROJECT LEADER - Supervise and participate in analysis, design, development, documentation, testing, implementation of client software. Require Bachelor's in Computer Science or Business Administration & 2 years experience in job or related EDP occupation. Experience must include IEF CASE TOOLS (BAA & BSD), DB2, SQL. $41,000/yr. 40hrs/wk. 8:00am-5:00pm. Job Site/Interv: Beaverton, OR. Send resume to Employment Department, Attn: Job Order #5550791, 875 Union Street N.E. Room 201, Salem, OR 97311.

FLORIDA Opportunities

CBA

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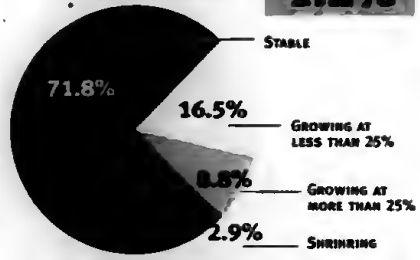
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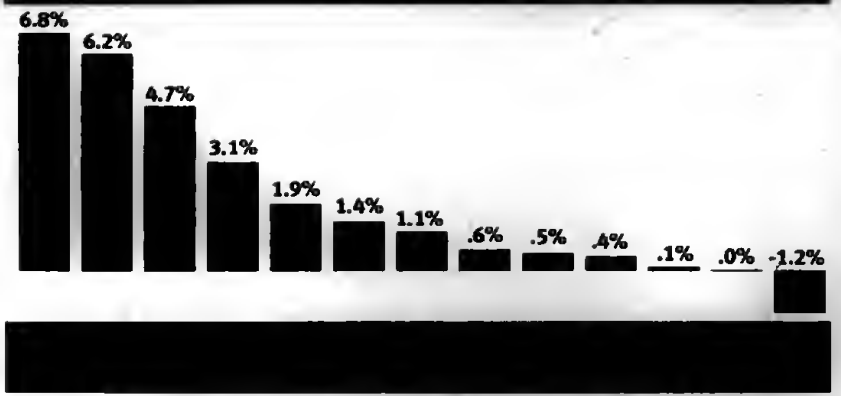
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Shopping for logistics

Logistics providers will take on distribution activities, but just be sure you choose one that works for you.

By Julie Hart

Four years ago, Sun Microsystems Computer Corp. turned its logistics process over to a third-party firm. Since then, it has slashed logistics costs by 30%.

The company feeds Sun's manufacturing line with materials and handles all product deliveries and returns. "Often we have pushes for more product at the end of the quarter," says Kathleen Holmgren, Sun's vice president of worldwide logistics. "Our provider manages the temporary work force influx required to handle the upsurge."

Like Sun, many companies striving for just-in-time manufacturing and delivery are replacing or downsizing in-house traffic departments. "That's just not the business we're in," Holmgren says. Logistics firms, on the other hand, specialize in controlling the flow of raw materials, in-process inventory and finished goods. They can also customize information systems for fast and efficient delivery of information via electronic data interchange (EDI).

As straightforward as it sounds, a relationship with such a firm should be established with care. "The logistics industry is still in [its] infancy," says Robert Lieb, a professor at the College of Business at Northeastern University in Boston. "Approximately three quarters of the [large] logistics partners have been in this business for five to seven years. Others have been in it for only two to three years."

This means heads up when listening to their pitch. Nearly every provider offers some form of EDI, for example, but the quality of information can vary. "If they can't provide the information that's important, it just doesn't matter," says Mitch Bentz, director of transportation at Merisel, Inc. in El Segundo, Calif.

Holmgren, for example, prefers daily reports detailing how many shipments were sent, where they went and what the current backlog is at any given moment. "This helps me make sure customers receive their orders on time and that orders go out the same day" they come in, she says. In addition to that information, Merisel requires historical data.

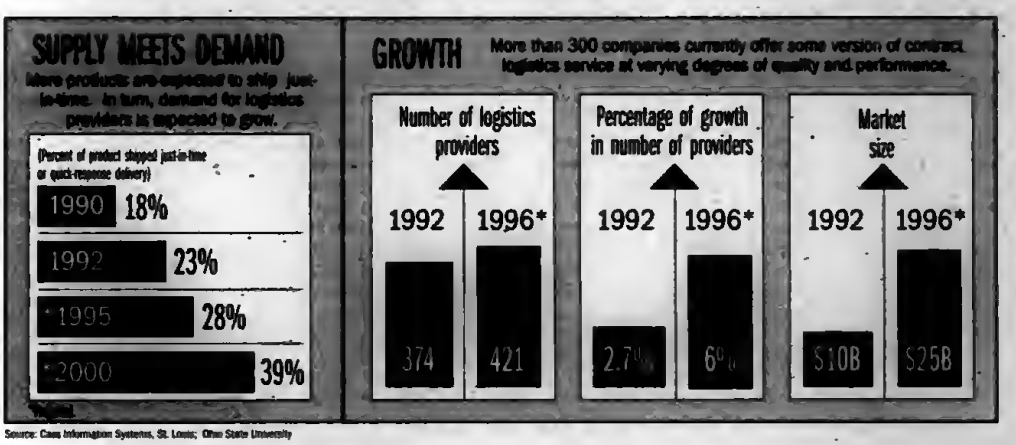
Merisel processes more than 1,000 inbound shipments per week using Roadway Logistics Systems in Hudson, Ohio, which has a number of subsidiaries and partners nationwide. "Roadway's partners provide information using the same systems," Bentz says. As a result, Merisel receives up-to-date reports nightly that cover shipments across the country.

A powerful partnership

"Make sure the company is financially stable and can deliver the services you demand — either on their own or through an alliance with another provider," Lieb says. This is especially important because, depending on the relationship, the company is likely to interact directly with customers. When Sun's customers return products, for example, they call Sun's logistics provider. "When selecting our provider, we went out into the industry to find the major players," Holmgren says. "We wanted to feel confident they had the professionalism and backing to provide a turnkey solution."

It's also wise to play it safe at first. "Start out on a modest scale," Lieb says. "Don't outsource your entire logistics function in one fell swoop." Instead, Lieb recommends that companies ink a one- to three-year contract and at the end of this period, decide if additional outsourcing is necessary. ■

Hart is a free-lance writer in Sunnyvale, Calif.



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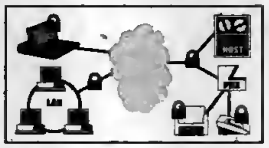
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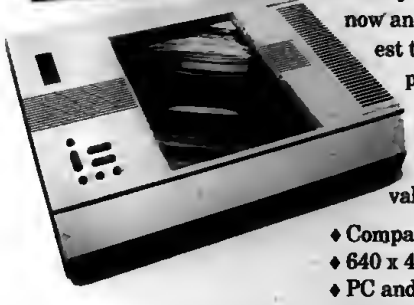
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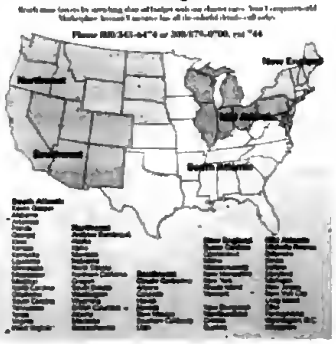
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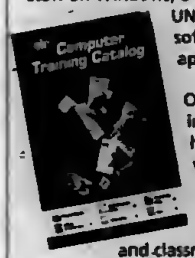
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Oct. 14 Stock Ticker

Gainers

Percent

Intuit Inc.	85.5
Zeos International Ltd.	43.4
McAfee Associates(M)	37.3
Network Equipment Tech.(M)	29.1
Stratacom Inc. (M)	26.5
Rainbow Technologies Inc.	25.0
Intermagnetics Inc.	21.7
Easterbrooks	21.4

Dollar

Intuit Inc.	27.00
Stratacom Inc.(M)	10.44
Peoplesoft(M)	8.25
Wall Data Inc.	8.25
Xylan	6.00
Xerox Corp.(M)	5.75
Policy Management Sys.	5.00
Apple Computer Inc.(M)	4.75

Losers

Percent

Barretec Inc.	-18.4
Sequoia Systems Inc.	-16.7
Mamulistics Group Inc.	-15.2
AST Research Inc.	-11.6
Magic Software Enterprises	-10.0
Maxton Corp.	-9.1
Nobar Systems Inc.	-8.0
American Power Conversion	-7.9

Dollar

Barotec Inc.	-4.50
Computrac Corp.	-2.13
Stratford Computer Inc.	-1.25
Advanced Micro Devices	-1.25
Bmc Software Inc.	-1.25
Intel Corp.	-1.50
Printronix Inc.(M)	-1.50
American Power Conversion	-1.50

Intuit Inc. jumped onto the gainers chart following Microsoft Corp.'s announcement that it will acquire the company. Lotus Development Corp. continued its slump after reporting a weak quarter.

Not for the fainthearted

Analysts agree that investing in technology stocks can be very rewarding, but they say you should be prepared for a very volatile market. This week we asked a few to offer tips to new investors:

Curt Rohrman, CS First Boston, New York: "October is probably the best time to invest in tech stocks. Companies typically start to come out of the summer doldrums and year-end demands surge, leveraging your earnings. Our research oo a group of 12 companies showed that their average returns went up from 2.5% in October to 5% in January over the last five years.

"Go for companies that show a solid strategic plan, preferably in industry segments that aren't yet in the spotlight. You want to detect them before everyooe else does.

"Wheo you do, watch them very closely. Unfike other stocks, technology stocks are cyclical. If you make money, reassess quickly. If the stock goes down, you should actually consider doubling rather than selling your investment. But you have to follow the company very closely to know whether the stock is fluctuating because of unimportant market forces or real problems."

Bob Czepiel, Robertson, Stephens & Co., San Francisco: "Try to understand as much as you can about the technology the company is in, especially its economic value. Look for the kind of management that is very good at explaining complex issues to its investors. And definitely talk to users. That's where the rubber hits the road."

Michael Murphy, "California Technology Stock Letter," Half Moon Bay, Calif.: "Go with a mutual fuod before you try investing in individual stocks. That way, you can get some money in there quickly without doing a lot of research.

"When you do go for individual investments, look for companies that are reporting sales growth of 15% or better — a 15% pretax profit margin, 15% return on eqoity and at least 7% on R&D.

"Once you've ideotified them, wait for Wall Street to knock them down. That usually happens if the companies report a weak quarter or enter a merger like Aldus and Adobe. Wall Street clobbered both of them, but their underlying numbers were great. It was a perfect time to buy."

—Erin Callaway

Exch	52-Week Range			Oct. 14 Wk Net	Wk Pct
				Oct. 14 Wk Net Wk Pct	
				Term. Change Change	
Communications and Networking					
OTC	40.00	13.69	1 COM Corp. (M)	19.63	1.63	4.1
NYS	43.50	36.25	AMERITECH Corp	39.25	1.00	2.6
NYS	60.63	49.50	AT&T	55.75	1.75	3.6
OTC	26.50	13.75	Bantam Systems Inc.	19.00	2.00	11.8
NYS	67.25	49.00	Bell Atlantic Corp.	52.38	1.38	2.7
NYS	63.88	52.05	BellSouth Corp. (L)	51.25	1.75	3.3
NYS	21.50	9.88	Bolt, Beranek & Newman	18.38	2.75	17.6
OTC	35.25	9.00	Brooktrout Technology	9.75	-0.25	-2.5
NYS	53.00	33.06	Cabletron Systems	46.25	1.00	2.2
OTC	45.50	16.00	Centigram Communications	16.25	1.00	6.9
OTC	60.25	31.50	Chipcom Corp	50.75	4.63	8.9
OTC	40.71	18.75	Cisco Systems Inc.	38.26	0.38	1.0
OTC	18.38	8.75	Compression Labs Inc	8.88	0.13	1.4
OTC	12.38	5.25	Computer Network Tech.	6.38	0.00	0.0
OTC	32.75	7.50	CrossComm (L)	9.00	0.00	0.0
OTC	3.00	1.50	Data Switch Corp	2.38	0.19	8.6
OTC	36.56	17.88	DSC Communications	51.13	2.13	7.3
NYS	32.38	8.25	General Datacomm Inds. (M)	30.75	1.50	5.1
NYS	39.88	29.50	GTE Corp	30.38	0.50	1.7
NYS	95.97	78.63	ITT Corp.	84.63	2.75	3.4
OTC	29.38	21.38	MCI Communications Corp.	25.88	0.19	0.8
OTC	0.38	0.38	Microcom Inc. (M)	8.25	0.88	11.9
OTC	21.35	11.25	NetManage Inc.	15.25	4.50	31.7
OTC	7.25	4.00	Netrix Corp.	6.15	1.00	19.3
OTC	8.75	3.25	Network Computing Devices	3.50	-0.35	-6.7
NYS	16.63	7.38	Network Equipment Tech. (M)	16.63	3.25	39.1
OTC	75.38	12.25	Network General	19.38	0.00	0.0
OTC	10.63	6.38	Network Systems Corp.	6.63	-0.31	-4.4
OTC	72.25	26.50	Newbridge Networks Corp.	31.88	0.00	0.0
NYS	39.75	26.00	Northern Telecom Ltd	35.38	1.38	4.0
OTC	26.63	13.38	Novell Inc.	16.00	-1.50	10.3
NYS	45.25	53.25	Rynex Corp	38.25	0.25	1.9
OTC	90.00	15.50	Octel Communications Corp	21.00	0.00	0.0
OTC	20.00	9.00	Optical Data Systems Inc.	17.00	-0.25	-4.2
OTC	7.50	3.13	Pearl Data Comm Networks	3.38	0.19	3.8
OTC	20.75	10.00	Picturetel Corp	17.00	0.50	3.0
OTC	9.35	2.15	Proteon Inc.	8.50	0.88	13.6
OTC	14.38	2.75	Racotek Inc.	4.13	0.13	3.5
NYS	32.63	13.44	Scientific Atlanta Inc.	20.13	1.00	5.2
NYS	61.25	36.25	Southwestern Bell Corp	41.25	0.13	0.3
NYS	40.13	31.38	Sprint Corp	38.13	0.50	1.9
OTC	26.75	13.38	Standard Microsystems Corp.	21.63	1.25	6.1
OTC	49.81	13.00	Stratacom Inc. (M)	49.81	10.44	26.5
OTC	31.75	13.13	Synoptics Communications	14.50	1.38	9.1
OTC	15.25	3.88	Telebit Corp.	5.00	-0.19	-3.6
OTC	46.00	23.00	US Robotics	34.25	2.75	8.7
NYS	50.75	37.25	US West Inc. (L)	38.00	0.00	0.0
OTC	43.88	18.63	Wellfleet Communications (L)	22.63	1.63	7.7
OTC	38.25	12.75	Xircom	27.50	3.25	11.1
OTC	29.50	13.25	Xylogics Inc	27.63	-0.38	-1.3
OTC	20.19	11.25	Xyplex Inc.	17.75	-0.13	-0.4
PCs and Workstations						
OTC	7.50	2.88	Advantic Logic Research	3.88	-0.13	-3.1
OTC	41.88	24.63	Apple Computer Inc. (M)	41.50	4.75	12.9
OTC	33.00	16.94	AST Research Inc.	30.94	-3.44	-11.6
NYS	39.88	20.51	Compaq Computer Corp	35.50	2.75	8.4
OTC	42.13	18.00	Dell Computer Corp. (M)	41.88	2.88	7.4
OTC	25.00	9.25	Gateway 2000 Inc	20.25	1.13	5.9
NYS	93.63	70.13	Hewlett Packard Co.	91.63	4.75	5.5
NYS	38.88	18.75	Silicon Graphics	25.25	0.50	2.0
OTC	31.38	18.25	Sun Microsystems Inc.	30.88	1.50	5.1
NYS	50.75	30.75	Tandy Corp.	43.25	1.38	3.0
OTC	5.13	2.50	Zeos International Ltd	4.75	1.44	43.4
Large Systems						
ASE	10.25	4.44	Amdahl Corp	9.00	0.50	5.9
NYS	8.50	4.38	Convex Computer	7.75	0.00	0.0
OTC	3.50	0.50	Cray Computer	1.38	0.00	0.0
NYS	33.75	18.25	Cray Research Inc.	30.88	0.25	1.2
NYS	10.75	6.63	Data General Corp.	10.63	0.63	6.3
NYS	58.63	41.25	Digital Equipment Corp.	52.63	-5.38	-9.6
OTC	8.38	2.38	Encore Computer Corp	4.28	-0.28	-6.2
NYS	51.75	40.97	Harris Corp.	47.65	-0.38	-0.8
NYS	73.00	42.88	IBM (M)	73.00	3.00	2.8
OTC	18.75	7.25	Keytronic	10.75	0.00	0.0
OTC	24.00	3.88	Parallan Computer	4.75	0.00	0.0
OTC	16.50	5.38	Pyramid Technology	8.88	0.38	4.4
OTC	20.00	11.13	Sequent Computer Sys	17.19	-0.06	-0.4
OTC	6.84	3.35	Sequoia Systems Inc.	3.75	-0.75	-16.7
NYS	38.65	22.88	Stratus Computer Inc.	34.00	-1.75	-4.9
NYS	17.50	10.00	Tandem Computers Inc. (M)	17.50	1.63	10.2
OTC	30.00	3.88	Tri-Cities Systems	5.30	-0.15	-2.2
NYS	18.50	8.63	Unisys Corp	16.88	-0.25	-2.2
Software						
OTC	37.50	19.00	Adobe Systems Inc. (M)	36.00	0.75	0.7
OTC	8.13	4.38	American Software Inc.	4.50	0.00	0.0
OTC	15.75	6.75	Ask Computer Systems	13.13	1.00	0.0
OTC	49.25	37.00	Autodesk Inc. (M)	47.00	3.00	6.7
OTC	3.88	1.75	Bachman Info. Systems	2.75	9.31	12.8
OTC	28.25	20.50	BGS Systems Inc.	22.25	-0.75	-3.3
OTC	73.00	40.50	BMC Software Inc.	43.35	-1.75	-3.9
OTC	31.00	22.50	Boole & Babbage	30.25	0.38	1.3
OTC	8.25	4.50	Brand Int'l Inc.	8.00	0.88	46.8
OTC	25.00	8.75	Brock Control Systems Inc.	9.25	0.61	7.2
OTC	4.19	2.38	CE Software	3.50	-0.13	-4.8
ASE	30.34	6.25	Cheyenne Software Inc.	9.63	0.11	1.3
OTC	15.25	8.50	Cognos Inc. (M)	15.25	1.88	14.0
NYS	48.75	27.38	Computer Associates (M)	48.25	3.00	6.6
NYS	5.38	2.13	Computervision Corp	3.50	0.25	7.7
OTC	49.75	22.75	Compuware Corp.	45.88	-2.13	-4.4
OTC	14.00	9.00	Commware Inc.	11.75	0.00	0.0
OTC	35.00	14.88	Corel Corp.	23.25	2.38	21.1
OTC	6.75	2.88	Easel Corp	3.38	-0.25	-6.9
OTC	29.25	14.25	Felerity Corp	23.75	1.25	5.6
OTC	25.00	3.00	4th Dimension	6.30	0.13	2.0
OTC	17.00	9.13	Frame Technology (M)	17.00	1.00	6.3
OTC	11.00	7.00	Group I Software	8.00	0.00	0.0
OTC	34.75	6.75	Gupta	11.38	1.13	11.0
OTC	11.50	5.75	Hogan Systems Inc	5.75	-0.50	-8.0
OTC	38.94	18.00	IMRS (M)	37.00	0.00	1.4
OTC	39.75	11.25	Information Resources (L)	12.63	1.13	9.8
OTC	28.00	14.25	Informix Corp	26.75	0.50	1.9
OTC	11.25	7.75	Intergraph Corp. (L)	8.00	0.00	0.0
OTC	9.25	2.50	Interleaf Inc.	4.13	-0.15	-2.9
OTC	17.00	7.50	Intersolv Inc.	17.00	2.25	15.3
OTC	68.25	27.00	Intuit Inc.	68.25	27.00	65.5
OTC	18.75	2.25	Knowledgeware Inc	5.81	0.19	5.2

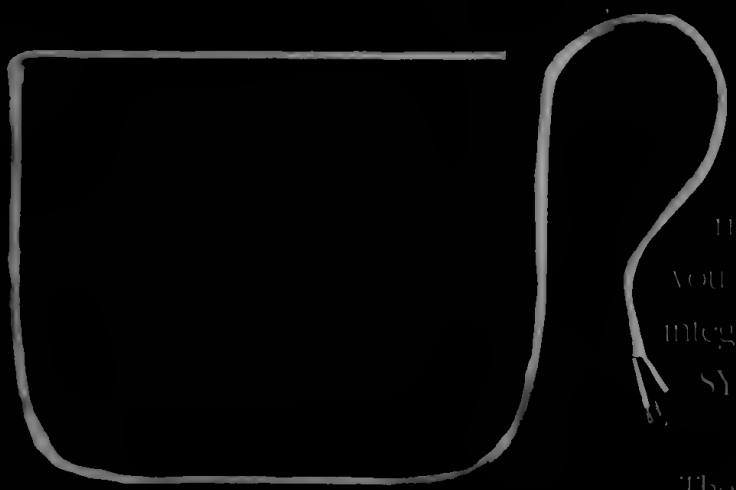
Exch	52-Week Range			Oct. 14 Wk Net	Wk Pct
				Oct. 14 Wk Net Wk Pct	
				Term. Change Change	
OTC	34.75	19.00	Lotus Corp	28.13	1.13	4.2
OTC	86.50	29.75	Lotus Development	36.38	0.00	0.0
OTC	10.00	6.00	Magic Software Enterprises	7.00	-0.88	-10.0
OTC	10.00	6.00	Mamulistics Group Inc.	7.00	-1.25	-15.2
OTC	7.38	1.44	MathSoft	3.25	0.38	13.0
OTC	14.25	4.38	McAfee Associates (M)	14.25	3.88	37.3
OTC	12.25	9.38	Mentor Graphics	11.38	-0.13	-1.1
OTC	24.25	11.50	Micro Focus	53.88	0.50	4.0
OTC	11.63	6.63	Microgratx Inc.	5.38	0.00	0.0
OTC	59.31	50.00	Microsoft Corp.	56.06	2.00	3.7
OTC	45.00	26.25	Oracle Corp	46.63	2.25	5.1
OTC	45.50	21.30	Parametric Technology	34.30	0.50	1.4
OTC	24.50	15.50	RasterPlace Systems Inc	22.50	2.00	9.8
OTC	55.25	26.00	Peoplesoft (M)	55.75	6.25	17.4
OTC	8.25	3.50	Phoenix Technologies	8.13	0.63	11.4
OTC	69.50	29.50	Powersoft	57.25	4.25	8.0
OTC	95.00	3.50	Platinum Software	55.50	2.13	58.7
OTC	23.25	7.25	Platinum Technology (M)	22.25	2.00	9.9
OTC	57.25	27.00	Progress Software Corp.	33.25	2.25	7.3
OTC	4.13	1.94	Quadrangle Office Sys.	2.13	-0.13	-5.6
OTC	21.00	9.50	Rainbow Technologies Inc.	14.38	3.88	25.0
OTC	9.25	3.00	Rasterops	4.25	0.75	21.4
OTC	13.75	2.88	Ross Systems	3.25	0.00	2.6
OTC	18.63	2.25	Sapiens Int'l. Corp. N.V.	9.50	-0.25	-6.3
OTC	16.81	9.75	Software International Inc. (M)	56.81	0.81	5.4
OTC	8.63	3.00	Software Publishing Corp	4.63	0.63	15.6
OTC	10.25	5.00	State of the Art	7.00	0.88	14.3
NYS	35.65	25.00	Sterling Software Inc.	29.13	-0.63	-2.1
OTC	19.88	3.63	Struct. Dynamics Research	5.25	0.31	6.3
OTC	57.50	52.38	Sybase Inc.	49.00	3.13	6.8
OTC	20.38	8.88	Symantec Corp	15.50	0.00	0.0
OTC	52.75	33.00	SynOptics	44.75	0.25	0.6
OTC	18.00	10.63	System Software Assoc.	11.63	-0.63	-5.1
OTC	6.75	3.25	Tsunic Corp.	4.63	0.13	2.8
OTC	36.00	11.25	Viewlogic Systems	20.25	1.63	8.7
OTC	23.75	12.00	Vmark Software Inc.	20.38	0.75	3.8
OTC	13.25	8.75	Walker Interactive Systems	7.75	0.38	5.1
OTC	60.00	29.25	Wall Data Inc.	38.00	6.25	19.7
Semiconductors						
NYS	31.75	16.75	Advanced Micro Devices	22.75	1.75	7.1
NYS	33.88	19.38	Analog Devices Inc.	32.75	5.00	4.8
OTC	12.75	10.94	Atmel Corp. (M)	30.69	0.19	0.6
OTC	7.30	3.63	Chips and Technologies	5.38	0.38	7.5
OTC	44.63	24.88	Cirrus Logic	29.38	0.75	2.7
NYS	20.38	11.75	Cypress Semiconductor Corp	16.75	1.00	6.3
NYS	30.13	13.00	Dallas Semiconductor	14.13	-0.75	-5.0
OTC	29.25	14.75	Integrated Silicon Systems	25.13	-1.13	-4.2
OTC	75.30	55.88	Intel Corp.	58.50	-1.50	2.5
NYS	80.38	13.00	LSI Logic Corp. (M)	38.63	-0.63	-1.6
OTC	27.75	12.35	Lattice Semiconductor	18.38	1.69	10.0
NYS	44.88	15.06	Micron Technology	33.75	-0.88	-2.6
NYS	55.75	42.13	Motorola Inc.	53.88	5.50	8.9
NYS	25.00	14.38	National Semiconductor	14.88	0.00	0.0
OTC	14.00	6.25	Sierra Semiconductor (M)	15.63	1.63	11.6
NYS	69.50	35.75	Texas Instruments	68.25	2.25	3.4
OTC	16.38	9.38	VLSI Technology	11.50	0.50	4.5
OTC	12.13	2.88	Winter	4.25	0.25	6.3
ASE	20.38	6.25	Western Digital Corp.	16.13	1.88	13.2
OTC	59.75	29.00	Xilinx	55.50	6.00	12.1
OTC	40.50	26.50	Zilog Inc.	31.13	5.13	13.5
Peripherals (Computer)						
OTC	30.50	16.50	American Power Conversion	17.50	-1.50	-7.9
OTC	36.50	18.75	Barotec Inc.	20.00	-4.50	-18.4
OTC	7.75	3.25	Cambex Corp.	4.63	0.13	2.8
ASE	7.38	1.88	Communications Corp.	2.13	-0.19	-5.6
NYS	11.50	8.50	Conner Peripherals	11.88	1.25	11.8
OTC	14.00	9.75	Creative Technologies Inc.	17.75	0.25	1.4
OTC	14.00	3.38	Data Race Inc.	6.00	0.25	4.3
ASE	10.75	4.13	Databam Corp.	6.38	-0.25	-5.4
NYS	23.00	12.38	Emc Corp.	21.00	1.13	5.7
OTC	10.50	3.13	Emulex Corp. (M)	10.38	1.75	20.3
OTC	21.00	11.50	Evans & Sutherland	12.25	1.13	8.5
OTC	22.30	12.75	Exabyte	21.75	0.25	3.6
OTC	28.50	2.63	Intelligent Info. Systems	3.30	-0.06	-1.8
OTC	4.38	2.00	Iomega Corp	3.63	0.63	20.9
OTC	0.75	3.88	IPL Systems Inc.	4.63	0.38	8.8
NYS	28.50	13.75	Komag Inc.	27.50	1.38	5.3
OTC	8.63	4.25	Maxton Corp.	4.38	-0.44	-9.1
OTC	8.75	4.88	Micropolis Corp	7.25	0.50	7.4
NYS	22.50	10.25	Pinnacle Micro Inc.	16.00	1.38	13.1
OTC	33.00	6.30	Printronix Inc. (M)	21.50	-1.50	-6.5
NYS	11.75	6.88	QMS Inc.	9.13	0.25	2.8
OTC	20.25	9.88	Quantum Corp.	15.50	1.00	6.9
OTC	18.75	7.25	Radius Inc.	9.00	1.38	18.0
NYS	17.75	0.38	Recognition International	7.13	-0.13	1.7
OTC	6.88	5.63	Reuon Inc.	6.88	-0.38	-7.8
OTC	28.75	18.05	Seagate Technology	25.15	2.13	9.2
NYS	41.50	24.75	Storage Technology	27.75	-1.00	-3.5
NYS	40.00	21.38	Unitrode Inc.	39.50	1.25	3.3
NYS	110.88	70.50	Xerox Corp. (M)	110.88	5.25	5.5
Services						
OTC	27.38	17.50	American Mgmt. Systems	26.13	0.06	3.5
OTC	6.25	2.50	Analysts Inc.	2.88	0.00	0.0
OTC	19.38	16.50	Analysts Int'l Inc.	19.38	2.00	11.5
NYS	57.38	47.63	Automatic Data Processing (M)	57.25	2.63	4.8
OTC	18.25	14.00	Cambridge Tech. Partners	15.94	1.63	11.6
NYS	37.50	17.50	Certican Corp.	36.25	1.38	3.5
OTC	24.25	17.25	Comdisco Inc.	30.63	0.50	3.5
OTC	13.00	6.50	Computer Horizons	13.00	1.25	10.6
OTC	40.25	29.50	Computer Sciences	42.88	1.25	3.0
NYS	10.38	6.38	Computer Task Group	8.25	0.00	0.0
NYS	28.63	6.75	Compusa Inc.	10.63	0.13	1.2
OTC	11.50	6.25	Control Data Systems Inc	9.38	0.13	2.8
OTC	11.00	6.13	Egghead Discount Software	8.25	0.00	11.9
NYS	38.00	26.50	General Motors E (DIS)	36.75	0.00	0.0
OTC	21.00	7.00	Inacom Corp.	9.63	0.75	8.5
OTC	28.00	11.63	Intelligent Electronics	11.63	-0.13	-0.8
OTC	22.50	2.00	Metrotel	10.13	0.50	5.2
OTC	99.30	9.75	Microdyne Inc	12.13	-0.63	-4.9
OTC	40.50	28.50	Paychex	38.50	2.25	6.2
NYS	44.00	22.25	Policy Management Sys.	44.00	5.00	12.8
NYS	28.25	18.00	Reynolds and Reynolds	25.38	2.13	9.1
OTC	28.50	17.00	SEI Corp	19.25	0.25	1.3
OTC	29.38	21.50	Shared Medical Systems	27.75	0.34	1.3
OTC	11.00	6.88	Shl Systemhouse	9.18	-0.19	-3.5
OTC	24.25	9.35	Software Spectrum Inc.	12.25	0.25	2.1
OTC	41.75	31.50	Sungard Data Systems	36.75	2.75	8.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Sybase raises ante on DB

CONTINUED FROM PAGE 1

• More parallel functions built into the core database engine rather than availability only via Sybase's Navigation Server add-on product.

• The ability to do "dirty reads" of data that has not been formally committed to the database, which could mean faster processing times for large applications.

• Built-in multithreading that will use 64K bytes of memory per user vs. other multithreaded implementations that can eat up to 2M bytes of memory per user.

A release behind

Approximately 10% to 20% of Sybase's 16,000 installed sites are in production with System 10-based applications, according to a Sybase spokeswoman. Most users are still on the previous version, Release 4.9.

Performance gain

"None of my customers has pushed System 10 to the limits yet, but more functionality is always a good thing," said Jim Panttaja, vice president of Panttaja Consulting Group, Inc., a San Francisco consulting firm.

The enhancements mean System 11 users could see a 20% to 30% performance jump, said Cory Isaacson, president of CompuFlex International, Inc., a third-party developer in Woodland Hills, Calif.

Much of the gain would come from giving database administrators more access to internal database workings so they could better tune the database for particular applications. Moreover, users could set different parameters for decision-support applications that process complex queries than they do for on-line transaction processing programs, where grinding through hundreds or thousands of updates is the norm, Isaacson said.

But with that flexibility comes a burden. Namely, some database administrators will need to know more about the intricacies of System 11 vs. what they need to know about System 10, observers noted. "Making those decisions will have a real impact on performance," Isaacson said. Sybase sites may have to spend more time training administrators, said Stuart Browning, a developer at Embarcadero Technologies, a consulting firm in San Francisco.

"For the people who want to really get in and optimize every cycle, that will require more training," Hartman agreed. Yet System 11 will also come with systems management tools designed to suggest default parameters for typical users, she added.

Headache saver

Overall, System 11's planned parallel features sparked the most user attention. The product will sport several extensions, including parallel indexes, queries, sorts, backup and recovery — all in the core SQL Server database engine. Formerly, Sybase offered such parallel features only through its add-on product, Navigation Server.

Thus, users will be able to set up midsize multiprocessing systems, such as those with eight or 16 CPUs, without the special add-on. "That'll be a huge savings in cost and headaches," Panttaja said, referring to the added fee for Navigation Server. That product, which is due to ship in December, is priced at $140,000, plus fees for each CPU.

As a result, Sybase will reposition Navigation Server as a high-end, massively parallel option, Hartman confirmed. Formerly, Navigation Server, which is several months late, was positioned as Sybase's primary multiprocessing product [CW, Sept. 19].

Best-of-breed suites

CONTINUED FROM PAGE 1

• Coda, Inc., a Manchester, N.H., provider of accounting software, is in discussions with several companies — including Microsoft Corp., Andersen Consulting and Cincom Systems, Inc. — to launch an applications coalition based on such emerging integration standards as Microsoft's Object Linking and Embedding (OLE).

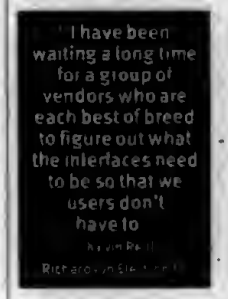
• Avalon Software, Inc. also claims to be working on a similar agenda. It would not reveal its potential partners but said the alliance would create an "enterprise model" on which all members would base their software.

Kevin Reilly, vice president of information systems at Richardson Electronics Ltd. in LaFox, Ill., said he is looking at client/server applications from Oracle Corp. and Computer Associates International, Inc. — not because he thinks those applications are the very best on the market, but because "everything works together."

"There is not, at the moment, a best-of-breed consortium so this is what I am forced to do, even though I would rather not," Reilly said.

Many users contacted recently said they are skeptical about whether software companies could pull off such alliances, but they think a best-of-breed application consortium would give them the best of both worlds.

According to analysts, the problem is it is difficult enough for a single vendor to build a fully integrated suite of applications — much less so for a number of independent parties with their own interests.



While the vendors planning alliances may say they will support such technologies as OLE, that does not translate into integrated applications for users. It means integration is more possible than with closed, proprietary systems, but it will still take programming to tie applications together.

Further, these software companies will need to address issues such as sharing data and the different application designs and architectures used to build their products that could conflict and make interoperability more difficult.

Everything a compromise

Companies such as SAP designed their suites from scratch to work as an integrated whole. But alliance planners say they can achieve equivalent integration by adopting their own integration model or adhering to industry standards.

Industry analysts said it would be unlikely for an alliance to achieve the level of integration that a suite such as SAP's R/3 now has. In R/3, for example, a user can update financial information in the accounts payable module, and that update will be reflected in every application in the suite.

Further, users said selecting applications can sometimes involve considerations beyond the best of breed vs. application suite debate.

"Everything we do is a compromise," said Chris Witham, vice president of information management at Hercules, Inc. in Wilmington, Del., which uses R/3. "You determine what is important to you and what criteria carries more weight."

Witham said his company enjoys a "strategic alliance" relationship with SAP. That level of comfort is something a vendor coalition probably could not provide, he said.

Bruce Richardson, vice president of research at Advanced Manufacturing Research, Inc. in Boston, predicted that such alliances would not last. "Guaranteed — the first $10 million potential deal, the alliance would collapse, and they would start selling against each other," he said.

A SAP spokeswoman declined to comment directly on any planned alliances. "We believe one of the key reasons we are the leading client/server applications provider is that we are a step ahead in delivering the integration customers need to run their businesses," she said.

IBM stirs mix

CONTINUED FROM PAGE 1

until then.

Richard Thoman, IBM's senior vice president and group executive of the IBM PC Co., is expected to focus on how internal changes have helped the company rectify some of its problems, as evidenced in part by the new PCs that Thoman will announce today. In particular, he will stress that IBM needs to execute more effectively.

Walking his talk

In his first major public appearance, Thoman will likely highlight a number of changes that have already taken place, including the reorganization of the PC Co. and the consolidation of several development, marketing and manufacturing operations to the Raleigh, N.C., area. He is also expected to stress product streamlining in the desktop arena, sources said.

Analysts say execution is key if IBM is to introduce solid products to market.

"Well, it's this year's model" for IBM, said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif. He said the new products should be well received, adding that Thoman deserved credit for putting the company in a position to revitalize itself.

"He had horrible problems with inventory and had to do a fabulous job to recover from the huge disaster he inherited. This [announcement] sets the table for another year to 18 months, but after that we'll have to see what happens," Brown said.

Product highlights will include the following:

• "Enterprise" class PC servers. The new IBM PC Server 500 will feature a 60/90-MHz Pentium processor. Six models will have eight slots and 22 bays. Prices start at $9,739.

• New high-end ThinkPad 755 notebooks, including a built-in CD-ROM drive, speaker phone and enhanced display. IBM is expected to make significant dents in its supply backlogs this quarter.

• A unified brand strategy for the ValuePoint and PS/2 desktops. The ValuePoint will become the IBM Desktop Series 300, and the PS/2 will become the all-Pentium Desktop Series 700. Both will feature more common parts and components than in the past [CW, Sept. 19].

A slow sinking

Former IBM PC Co. President Robert Corrigan used to joke that haphazard efforts at rightsizing and downsizing could lead to capsizing. Despite various revampings at IBM, its market share is, ironically, sinking. Most market researchers show it dropping from first to fourth in units shipped in the PC market this year.

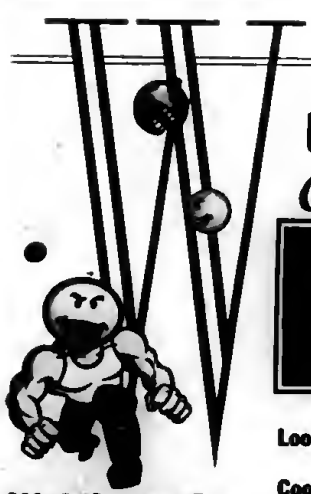
But few of the products will ship before November, according to sources briefed on the announcement. Some will not ship until the first quarter of next year, which could mean severe backlogs for users.

Time to get going

Some analysts said the focus on strategy may do little to correct IBM's fortunes in the market.

"They are redoing brand strategy at a time when they really need to be more concerned with getting some momentum in the market," said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass.

IBM officials are merging the PS/2 and ValuePoint into one brand to gain economies of scale and rationalize their branding strategy. Many say they will reserve judgment on this approach.



Wysiwyg BOING!

Watch out for the following viruses:

ARNOLD SCHWARZENEGGER VIRUS
Terminates your session and then disappears. It'll be back.

WARREN COMMISSION VIRUS
Won't allow you to open your files for 75 years.

GOVERNMENT ECONOMIST VIRUS
Nothing works, but all your diagnostic software says everything is fine.

GALLUP VIRUS
Sixty percent of the PCs infected will lose 38% of their data 14% of the time (plus or minus a 3.5% margin of error).

ADAM AND EVE VIRUS
Takes a couple of bytes out of your Apple.



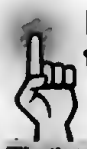
AIRLINE VIRUS
You're in Dallas but your data ends up in Singapore.

FREUDIAN VIRUS
Your computer becomes obsessed with its own motherboard.

Source: gopher chaos.bsu.edu (Ball State University)

Looking to spice up your Windows environment? Cool Software in Portland, Ore., is offering SoundLink+, software that lets you choose a sound to attach to any Windows event. Up to 30 sounds are available, and a sound card is not required. The software is free and can be downloaded from the Internet. Send an E-mail to sound@coolsoft.com for downloading instructions.

Let your finger do the walking



Using the 'finger' command on the Internet, users can access the following information:

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Recent earthquakes	finger quaker@geophys.washington.edu
Bad pun of the week	finger sdries@nyx.du.edu
Daily events	finger copi@oddjob.uchicago.edu

Source: "Internet After Hours" by Andy Eddy

WYSIWYG COMPILED BY TIM OUELLETTE, ILLUSTRATED BY DAVE MARSHALL

Inside Lines

Chasing the money

At least for this week, Chase Manhattan Bank in New York said it remains committed to Microsoft Money — even though Microsoft isn't. A Chase spokeswoman said the company still plans to launch its on-line home and banking service for Money today, despite the fact that Microsoft sold the product to Novell last Thursday (see story page 12). Chase and Microsoft had planned to launch the home banking service based on Money last week but then canceled the joint announcement.

AppWare anyone?

Further evidence that Novell's AppWare is unlikely to rise from the dead: John Edwards, director of the former AppWare group, has been reassigned. Taking a page out of the Microsoft tent meeting playbook, Edwards is now a Novell "evangelist." His job is to travel the country and explain the Novell story to users far and wide. If only Novell knew what parable it wanted him to tell.

All stressed out and ready to quake

It's every San Franciscan's nightmare: The Golden Gate bridge tumbles into the bay during a major earthquake. And now a group of engineers say their seismic stress simulation, done on a Sun Microsystems Unix server, proves that an 8.3 magnitude temblor would do just that. The Golden Gate Bridge and Highway Authority contracted with engineering teams last year to analyze both the north and south approaches for a seismic retrofit. "In the 8.3 earthquake, the whole thing would fail," said Jawahar Gidwani, president of ISEC, an engineering firm in San Francisco. Now all that's needed is about $150 million in funding to make those seismic repairs on both sides. Here's hoping things hold steady 'til then.

Compaq Elites not delighting

A user at a large financial institution in Dallas, who asked not to be named, tells us that persistent problems with Compaq's LTE Elite notebook computers caused the organization to return all 12 of the notebooks it purchased less than two months ago. The user cited problems with PCMCIA cards as well as buggy memory, keyboard problems and frequent but mysterious system hangups. According to the user, despite several attempts, Compaq so far has been unable to solve the problems. Compaq says this customer may be among those who received a batch of LTE Elites shipped earlier this year with problems related to PCMCIA card timing. A spokesman for the company said that in all such cases Compaq would swap customers' hard drives into new boxes.

Can't start a fire without a spark

Rumors ran rampant last week about IBM's making a $150 million offer to buy switching vendor and OEM partner Kalpana to beef up its Token Ring LAN switching technology. While neither company would officially confirm or deny a deal was in the works, one Kalpana official said, "We would certainly never sell for as little as $150 million." Analysts say they expect a deal to take place, and some estimate the purchase price could be as high as $240 million. Not bad for a privately held company that did a modest $40 million in business last year. "Kalpana right now is like Snapple — its stock is soaring for no apparent reason," said one analyst.

So where's the beefcake? Sports Illustrated *has teamed with SoftKey International to put its famous — or infamous, depending on your point of view — Swimsuit Calendar on CD-ROM for Windows. Thirty bucks will get you 70 full-color photos featuring 18 swimsuit queens, along with printable calendaring and scheduling software (no, not for dates with the models). If you have any revealing tips or feel we're all wet about something, get in touch with* Computerworld *by calling our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 600-3017.*

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